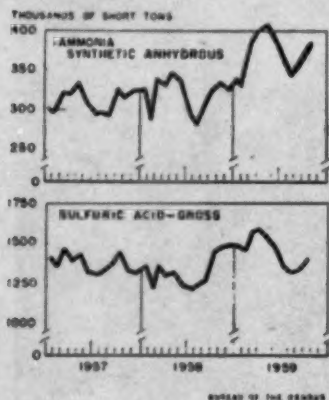


Inorganic Chemical Production Totals Reported by USDC

**Generally Higher
October Output
Throughout Industry**

WASHINGTON—The October, 1959 production levels for industrially important inorganic chemicals in the U.S. were generally higher than those reported for September, 1959 and for the corresponding month of last year, according to information compiled by the Bureau of the Census and collect-

PRODUCTION OF INORGANIC CHEMICALS



ed in cooperation with the Business and Defense Services Administration, U.S. Department of Commerce.

Increases from September were reported for 35 of the 44 chemicals included in this report while the output of 9 chemicals was lower. In comparison with October, 1958, the October, 1959 reports show production increases for 37 chemicals and decreases for 7. During the month quantities held at producing plants increased for 22 and declined for 15 chemicals. These monthly figures are unadjusted

(Turn to INORGANIC, page 29)

Baltimore Firm Buys New Business In Pennsylvania

BALTIMORE—James E. Totman, president of the Summers Fertilizer Co., Inc. of Baltimore, announced the acquisition of the A. D. Graham & Co. mixed fertilizer and farm supply business established in 1928 at Somerset, Pa. The facilities at Somerset will be used also as the new home for Summers' Kapco Division which had outgrown the capacity of the McKeesport, Pa. plant. This latter property has been sold to a distributor of petroleum products.

The new owners will continue the Somerset operations as the Graham Division of the Summers Fertilizer Co., Inc. A. D. Graham has not been associated with the business since Jan. 1, 1960, but all other personnel will be retained. Fleming Casebeer will continue as manager of the field fertilizer, seed and farm supply business.

Howard Miller, Kapco division manager for the past several years, will continue as manager of Kapco at Somerset and will be Summers' senior representative at this location.

First in a series . . .

New England Non-Farm Use of Fertilizer Reported

NON-FARM use of commercial fertilizers on lawns, gardens, and house plants during the year ending June 30, 1959, amounted to about 53,700 tons in the New England states, according to a report just issued by Arnon L. Mehring, presently a private fertilizer consultant and formerly with the U.S. Department of Agriculture. Mr. Mehring's report is the first of a series of regional studies of the non-farm fertilizer market. It supplements the nationwide study made by Mr. Mehring in 1956.

The fertilizer tonnage averaged about 41.5 lb. to the household, he

Knight in Shining Armor . . .

Flemming Seeks to Woo Congress Towards More Anti-Chemical Legislation

By JOHN CIPPERLY, Croplife Washington Correspondent

WASHINGTON—Chemical manufacturers in general who make products used in food for human consumption or feed for animals, and the agricultural chemical industry in particular, can take little comfort from the direction being taken by the Ohio college professor, Arthur S. Flemming, Secretary of Health, Education and Welfare. The Secretary is apparently moving in as his own commissioner of the Food and Drug Administration, to sensationalize his condemnation actions on the misuse of chemical compounds in the production and processing of foods and animal feeds.

Condemnations of contaminated foods in the past have been pursued vigorously by previous FDA commissioners without any appeal to the public to wring out the last drop of sentimental support. In short, FDA commissioners in the past have been above political desire until Mr. Flemming came on the scene and devastated two industries with his sensational publicity barbs against the chemical industry through his ban on cranberries and later on some poultry products.

Mr. Flemming's image in the public mind approaches the heroic. He

means no harm to anyone. He is merely a knight in shining white armor who would protect women and children and their bread-winners against the depredations of chemicals in the processing and production of our food supply.

If that were the total ambition of this eager gentleman one might say "amen," but according to wise observers at U.S. Department of Agriculture, the current Flemming campaign

(Turn to FLEMING, page 4)

Potash Output Up 10%, USDI Reports

WASHINGTON—Marketable output of potassium salts in the U.S. in 1959 totaled 2.4 million short tons of K₂O equivalent, 10% more than in 1958, according to preliminary estimates by the Bureau of Mines, U.S. Department of the Interior. Based on nine months data, potash sold or used was estimated to be 5% more than in the previous year, totaling 2.5 million tons of K₂O equivalent.

Based on partial-year data, imports of potash increased about 7% and exports increased about 8%.

The potash leasing regulations were revised to permit holding of 25,600 acres in a single mining unit equal to 2 units formerly allowed.

Exploration in the Saskatchewan potash field in Canada continued but no additional companies began development during 1959.

The Potash Company of America, Ltd. made its initial shipment of potassium chloride in March to eastern Canada. Later shipments went to the U.S. and Japan. Total shipments during 1959 were 74,000 tons, of which 11,000 tons went to the U.S. The mine and refinery were shut down indefinitely late in the year because of technological problems.

International Minerals & Chemical Corp. (Canada) Ltd. states that shaft sinking was scheduled to be resumed at the end of the year. Sinking was stopped in mid-1958 to enable consolidation of the Blairmore formation. Surface facilities were completed.

Old, New Herbicides, Application Methods Discussed at Northeastern Weed Meeting

NEW YORK—The 14th annual Northeastern Weed Control Conference held at the New Yorker Hotel here Jan. 6-8 heard papers on herbicides new and old; on application techniques; public relations, and how to control unwanted vegetation in various crops and at roadsides. The registrants were mainly from the New England states, New York, New Jersey and Pennsylvania, with additional delegates from other areas of the East.

A paper describing techniques involved in use of chemicals for establishing wildlife clearings was presented by H. A. Trumbo and W. E. Chap-

pell, Virginia Agricultural Experiment Station, Blacksburg, Va. They pointed out that bulldozing and hand labor are commonly used for establishing and maintaining wildlife clearings, but these methods are regarded as being costly.

Experiments at Virginia Polytechnic Institute in 1956 and 1957 indicated that herbicides seemed feasible for use, and two field experiments were set up on land operated by the U.S. Forest Service and the Virginia Commission of Game and Inland Fisheries, to evaluate the effectiveness of herbicidal treatments. Costs were

(Turn to CONFERENCE, page 8)

The previous study had indicated that about 64,000 tons of fertilizer had been used for all non-farm purposes.

(Turn to SURVEY, page 8)

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Cinnabar Moth . . .

USDA Imports Insect from Europe To Fight Tansy Ragwort in Western U.S.

WASHINGTON—An insect that feeds on a toxic weed called tansy ragwort has been released in large numbers in an effort to control this weed, now invading coastal areas of California, Oregon and Washington, the U.S. Department of Agriculture reported.

Larvae of the insect, the cinnabar moth (*Ytira jacobaeae*) were released last June in four West Coast areas heavily infested with the weed. It is hoped by scientists of USDA's Agricultural Research Service and the California Agricultural Experiment Station that the moth responds to the climate in the release areas and will emerge next spring at the time the tansy ragwort plants are starting to form flower buds.

The insect is the natural enemy of tansy ragwort in Europe and Great Britain, according to James K. Holloway, ARS specialist in biological weed control, and state scientist Dr. Carl B. Huffaker, who are cooperating in the research. This weed endangers livestock. It is more toxic to horses than to cattle, and sheep frequently eat the plant without harm.

An aggressive biennial weed, tansy ragwort competes with valuable range grasses and is spreading over more land each year. Chemicals will control it, but areas of infestation are so great, and in many cases so inaccessible, that spraying is not economically feasible. Thus, if range grasses grow fast enough in areas cleared of tansy ragwort by the cinnabar moth, they will keep the weed from reinfesting the land.

Proof that the cinnabar moth has no liking for any useful plants was

established in feeding trials at the ARS parasite introduction laboratory, Paris, France, by USDA entomologist Dr. Harry Parker. Dr. Parker collected the moths, raised larvae in confinement to insure freedom from parasites, tested them on many plants to guarantee that they are specific to tansy ragwort, and sent about 6,000 parasite-free larvae to Mr. Holloway in California.

Originally scheduled for completion in 1957, the trials were extended to include feeding tests with safflower, a relative of tansy ragwort, now grown in California as a commercial oilseed crop. The tests proved that the moth could not reproduce on safflower or any other plants previously tested.

Importation of the natural enemy should offset the weed's spread and bring about eventual control. Placed in fields heavily infested with the weed, the orange-and-black-ringed larvae took at once to the plants and began to feed upon them voraciously.

Normally, the larvae pupate in the soil at the base of the plants during the mid-summer. The adults emerge in the early spring and the females lay their eggs on the underside of the tansy ragwort leaves. Larvae emerge from the eggs to feed on the foliage and young buds of the plant before dropping to the ground to continue their life cycle. Continued seasonal defoliation destroys the seed heads and greatly depletes the plant's food reserve, usually resulting in destruction of the weed.

As in the case of the Klamath beetle introduced to control Klamath weed, this form of control will not completely eliminate tansy ragwort. It should, however, keep it controlled to the point where the weed no longer causes economic stress.

Delaware Announces Plans for New Department of Agriculture

WILMINGTON, DEL.—Gov. J. Caleb Boggs announced plans for a new Department of Agriculture to help encourage agricultural expansion in Delaware and to improve coordination of activity in this field.

Gov. Boggs proposed an inspection division to perform certain duties of the present state board of agriculture in regulating the sampling, analysis, processing, labeling and sale of fertilizer, seed, feed and liming materials.

He urged the establishment of a plant pathology and pest control division to assume certain duties now performed by the State Board of Agriculture in enforcing regulatory laws.

He favored a marketing and promotion division, which would be responsible for duties now performed by the State Board of Agriculture's bureau of markets, state apple commission and state poultry commission. This division would have three sections dealing with market news, fruits and vegetables and poultry.

"Our diversified products, including poultry, dairy, truck crops, fruits, grain and hay, hogs and beef cattle, result in average annual cash receipts in excess of \$100,000,000 from farm marketing," Gov. Boggs said. "The annual income of farm proprietors and farm laborers totals about \$25,000,000."

Gov. Boggs said a bill to set up the Department of Agriculture will be introduced in the state legislature when the latter body reconvenes.

ERNEST A. SCHUELER DIES

BUFFALO, N.Y.—Ernest A. Schueler, 58, former proprietor of the Erie-Niagara Farmers Supply here, died Dec. 20. He sold the business in 1948 and became a fertilizer manufacturer's representative.

Canadians Report On 2,4-D, MCPA Use

WINNIPEG—An estimated 2,038,000 acres of field crop land in Manitoba were treated with the herbicides 2,4-D and MCPA in 1959. The figures released by the Manitoba Department of Agriculture place this at 2% below the estimated acreage treated by the same two chemicals in 1958. Saskatchewan acreage treated in 1959 was 46% higher than a year earlier and in Alberta the increase was 17%.

Weather played a dominant role in the over-all decline of treatment in Manitoba. In the drier western areas of the province use of chemicals increased during the year, but this was offset by a large decrease in the wetter regions, particularly the Red River valley.

In Manitoba, five times as much 2,4-D was used in 1959 as compared with MCPA. The ester formulation of 2,4-D was more popular than the amine formulation, being applied to over 70% of the treated acreage. On the other hand, more MCPA amine than MCPA ester was used. Ninety-eight percent of the Manitoba acreage treated was sprayed. Even less dust was used in 1959 than the previous year.

Chemical companies reported a greater use of herbicides for fall treatment of perennial weeds on stubble fields. Use of soil sterilants decreased slightly, the report stated. Aerial spraying also decreased.

Robert E. Ashcraft Elected to New Post

ATLANTA, GA.—Robert E. Ashcraft was elected executive vice president of Ashcraft-Wilkinson Co., announced George W. McCarty, chairman of the board of directors.

Mr. Ashcraft has served as vice president of the Atlanta firm since 1949. He joined the company following his graduation from the University of Alabama in 1929, working as a salesman out of Atlanta. He subsequently served as branch manager of the Wilmington, N.C. and Norfolk, Va. offices, returning to Atlanta in 1955 as regional sales manager.

The company was founded in 1912 by his uncle, the late Lee Ashcraft, and Mel R. Wilkinson, with offices in Atlanta. Expansion has included location of district sales offices at Norfolk, Va.; Charleston, S.C.; Tampa, Fla.; Jackson, Miss.; Columbus, Ohio; Montgomery, Ala., and Des Moines, Iowa.

Ashcraft-Wilkinson serves as exclusive sales agent for Duval Sulphur & Potash Co., Escambia Chemical Corp., and also handles other chemicals for agricultural and industrial fields. They operate their wholly owned subsidiary, Flag Sulphur & Chemical Co., Tampa, Fla.

Robert E. Ashcraft



George K. Black Richard W. Klipsch

McCarty Sells Evansville Operation to Seedkem, Inc.

EVANSVILLE, IND.—The J. A. McCarty Seed Co. has sold its Evansville seed, feed, agricultural chemical, farm supply and wholesale operations to Seedkem, Inc., a newly organized corporation, according to a joint announcement of Seedkem management and J. A. McCarty, founder of the seed firm.

George K. Black, with McCarty for 14 years, is president and general manager of the new company, and Richard W. Klipsch is secretary-treasurer and sales manager. W. Vernal Klipsch, Richard's father, is vice president.

Mr. Black and Mr. Klipsch are graduates of Purdue University's college of agriculture. Mr. Black is past president of the Indiana Seed Dealers' Assn. and past chairman of Asta division, American Seed Trade Assn. Prior to joining the new firm, Mr. Klipsch had been with the sales department of Hahn, Inc., Evansville manufacturer of farm machinery.

The business of Seedkem will be continued at 526 N.W. Fourth St. in Evansville, the same location as previously occupied by the McCarty firm.

The portion of the McCarty business sold includes the processing and sale of farm and garden seeds, the sale of farm chemicals and other farm and garden supplies and equipment.

The J. A. McCarty Seed Company was established in 1931 by Mr. McCarty and his wife.



AT CALIFORNIA FERTILIZER ASSN. MEETING—Board of directors elected at recent meeting of the California Fertilizer Assn. at San Francisco. Members of the board are seen in top photo. Seated, left to right, are Lawrence M. Roberts, secretary, Shell Chemical Corp., San Francisco; Fred R. Bryant, Brown & Bryant, Shafter; William M. Cline, American Potash & Chemical Corp., Los Angeles; Les R. Hamilton, California Spray-Chemical Corp., Richmond, and James F. Sloan, 1960 vice president, J. F. Sloan Co., Salinas.

Standing, left to right: Sam Mooschekian, Downey Fertilizer Co., Downey; John N. Williams, 1960 treasurer, General Fertilizer & Supply Co., Chula Vista; Demott W. Galbraith, 1960 president, Agriform of Northern California, Inc., Woodland; Howard H. Hawkins, 1958-59 president, Golden State Plant Food Co., Glendora; John Taylor, John Taylor Fertilizers, Sacramento, and Sidney H. Blerly, CFA general manager, Sacramento.



Lower photo: Panel on "Technical Progress and Business Stability" at CFA meeting. From left to right at table: Floyd Hornbrook, the Best Fertilizer Co., Lathrop, Cal.; Dr. Malcolm McVickar, California Spray-Chemical Corp., Richmond; Dr. Guy F. MacLeod, Sunland Industries, Inc., Fresno; D. W. Galbraith, CFA president; E. L. Luckhardt, Collier Carbon & Chemical Corp., Los Angeles, panel moderator; Lawrence M. Roberts, Shell Chemical Corp., San Francisco; William E. Snyder, Wilbur-Ellis Co., Los Angeles, and James F. Sloan, J. F. Sloan Co., Salinas.

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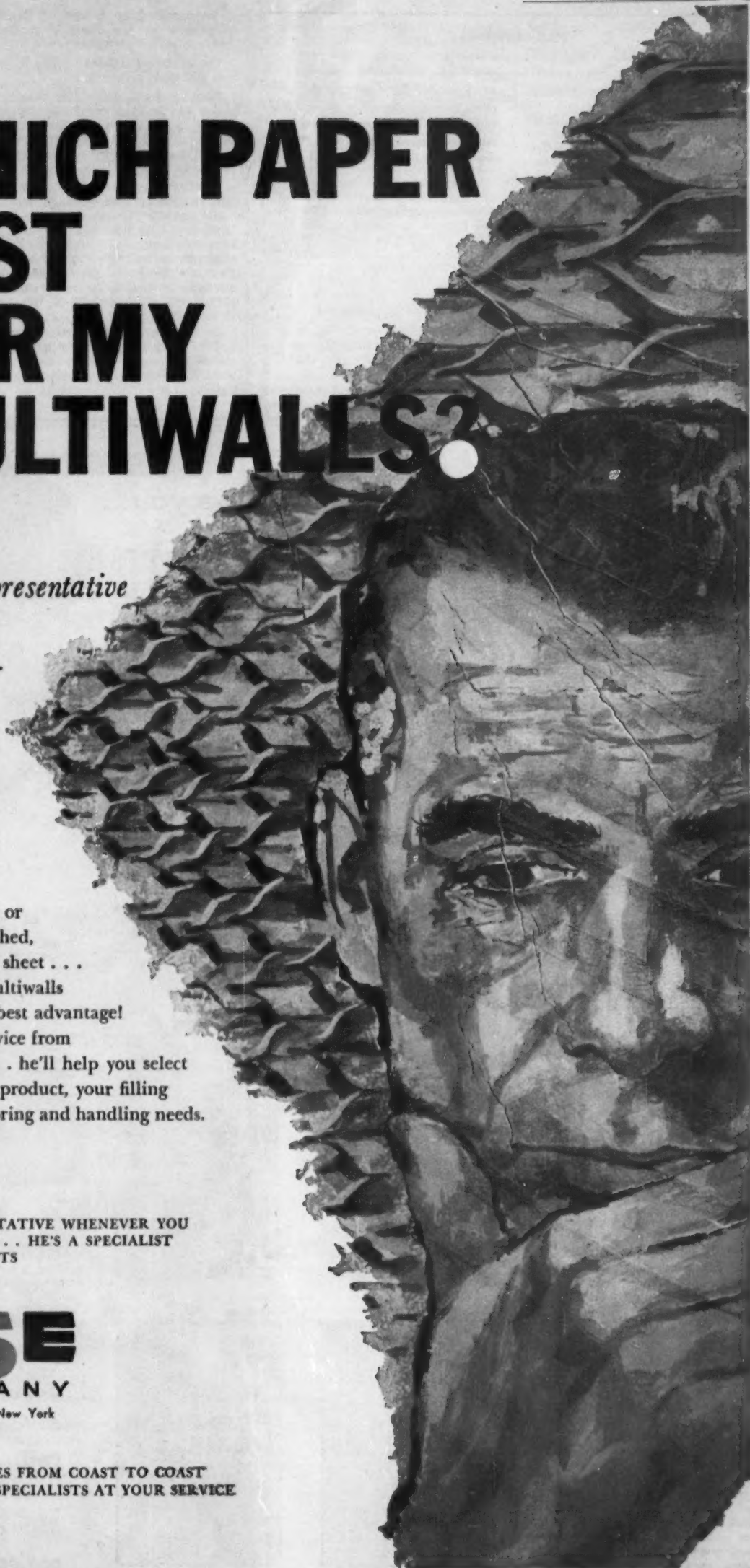
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FLEMMING

(Continued from page 1)

paign is not without deeper connotations.

It is now seen that FDA (FDA under the Flemming domination) intends to provoke in Congress a Kill-kenny which might lead to a decision to take from USDA its authority to certify chemical compounds as necessary for the production of agricultural commodities as now provided in the FDA law. Such a move might also remove from USDA its inspectorial services over processed fruits and vegetables and even the storage of grains. This intention would also provide that FDA would take over the inspection of poultry products and meats now covered by special legislation passed by Congress. It might further involve the meat packers and stockyard act since FDA is now showing interest in studying the use of an estrogenic substance used to speed up the fattening of cattle.

This compound, a synthetic estrogen which is representative of a distillate of urine from female animals, is widely used in cosmetics. It may be recalled that when FDA had its intensive drive on the presence of rat pellets in grain, FDA officials asserted that the issue was one of esthetics and not one of actual hazard to people. But at that time they smilingly dismissed the "esthetic" problem of concentrates of female animal urine to make up the estrogenic substance used in lipstick—a product obviously widely used by women. Kiss, but don't tell.

In a recent statement made by George P. Larrick, FDA commissioner, at the American Farm Bureau Federation meeting at Chicago, he enunciated some remarks which carry overtones and undertones of what the chemical industry may expect. Read alongside one another, it may seem that Mr. Larrick's boss, Secretary Flemming, may be thinking along another mental avenue. But here are some time-bomb excerpts from comments made by Mr. Larrick at the AFBF session:

"All of us have emphasized the necessity of following the label on registered pesticides (misuse). Seed companies usually treat more grain than they expect to sell . . . The surplus grain is not suitable for seed purposes the second year . . . Farmers have diverted surplus treated seed for food and feed use . . . The need for adequate regulation is illustrated . . . When it became apparent that seizures by FDA were not a controlling factor of diversion, we filed criminal actions . . . However the economic incentive is so great that these actions can hardly be expected to control the problem adequately . . . We are studying the advisability of issuing a public notice that seeds of food grains which have been treated with toxic chemicals will be regarded as illegal in interstate commerce . . ."

Can there be any doubt of the direction in which FDA may be leading? It is the sensational publicity path, if its current secretary Mr. Flemming and his cranberry and poultry venture may be observed as an index.

In his statement to the AFBF convention, Mr. Larrick went on farther to say with the usual FDA vagueness—or lack of precise clarity—"We must be in a position to assure the public it is receiving adequate protection. Enforcement of the pure food and related laws must keep pace with rule making. This matter deserves careful consideration . . . there are a number of possible solutions . . . one would be to change the law to provide that USDA and FDA shall not apply a new use of a pesticide on food crops unless there is an affirmative showing that the facilities

are available for enforcing the new rule. Perhaps there are other solutions. We have not decided yet what recommendation to make to our department in this matter."

Reading the above last paragraph, one might only conclude that Mr. Larrick is sending up the Flemming trial balloon in regard to the elimination of USDA in the food field as to use authorization of chemicals for food production—the inspection of meat and poultry products for consumption and the inspection of fruits and vegetables in processing.

This threat is real—before the chemical and agricultural industry just as surely as the sun will rise tomorrow.

It is promoted by a gentleman who

is impregnated by a burning desire to remain in the nation's capital, preferably at a high post.

The chemical industry faces up to two unhappy prospects:

First, it must defend its products against the publicized charges of Secretary Flemming that some chemical compound under laboratory controlled conditions, may have caused cancer in rats.

It must face up to the clearly implied possibility that if the Flemming torch can take fire in Congress, that legislative body will take from USDA its current check authority on FDA excesses to authorize use of a new chemical compound on the basis of scientific evidence that it is necessary for the production of the national food supply.

Mr. Flemming, who now evidently has usurped the office of his FDA commissioner, is moving into the spotlight. He is not to be dismissed lightly.

Regional Meeting Planned

SPOKANE, WASH.—A regional fertilizer industry conference will be held at the Inland Power & Light Co. auditorium here, Jan. 29, announced the Pacific Northwest Plant Food Assn., sponsor of the event.

Highlight of the affair will be a panel discussion on "How to Sell a Fertility Program."

FIRST QUARTER SALES

NORFOLK, VA.—Net income of \$645,922 for the first quarter of the current year, compared to \$373,972 for the same period last year, and net sales of \$9,509,426 compared to \$7,331,385 last year, were reported by the Smith-Douglass Co. in its quarterly report to stockholders. Earnings per common share rose to 63¢, compared to 35¢ for the same period last year. It was noted that sales and earnings in the first quarter are not of sufficient volume to be indicative of probable year-end results.

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50% more acreage than
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Five Fertilizer Analyses Available to Canadians

WINNIPEG—Five new fertilizer formulations will be available to Manitoba farmers this spring, said H. E. Tolton, soils specialist, Manitoba Department of Agriculture.

The new formulations are: 23-23-0, 24-20-0, 10-30-10, 14-14-7, and 13-13-13. Two of the introductions, 23-23-0 and 24-20-0 will require further testing by Manitoba agronomists before definite recommendations can be made.

While much of the experimental work on the new fertilizers was carried out in North Dakota, limited use in Manitoba indicates that they have a place in this province, Mr. Tolton pointed out.

Both 23-23-0 and 24-20-0 will be used primarily for cereal crops. As shown by the analysis, which indicates the proportion of nitrogen, phosphorus and potash in that order, the percent-

age of nitrogen has been increased from that contained in the old stand-bys—11-48-0 and 16-20-0. The 24-20-0 formulation should prove effective on stubble land at a rate of approximately 70 lb. per acre. In the high lime soils of the interlake region and immediately west of Lakes Manitoba and Winnipegosis, 23-23-0 is suggested for cereals on stubble land at a rate of 70 lb. per acre.

The complete fertilizer, 10-30-10 simply replaces 10-32-10. Greater ease of manufacture encouraged the introduction of this formulation. Recommended rates of application of 10-30-10 were approved at the Manitoba Agronomists Conference in December. Where potatoes are grown after fallow on sandy loam soils, 200 to 300 lb. per acre of 10-30-10 should be used. It is also recommended for those districts which are potash deficient for cereal crops. These districts are located in the southeastern corner of the province and along the Swan River.

The remaining two complete fertilizers, 14-14-7 and 13-13-13 are also especially designed for potato crops. The 14-14-7 formulation is recommended for sandy loam soils at 200 to 300 lb. per acre for potatoes grown on second crop land. No recommendations have been made for 13-13-13, Mr. Tolton noted.

All the new fertilizers are available in granular form. Experimental tests on the five will continue in 1960.

TO DISCUSS WEEDS

UNIVERSITY PARK, N.M.—Control of weeds will be the chief topic of discussion at the fourth annual New Mexico Fruit and Vegetable Short Course here Jan. 14-15. Dr. W. D. Pew, horticulturist with the Arizona Experiment Station, Mesa, will make the featured address. M. Baxter Jones, assistant horticulturist, New Mexico State University Experiment Station, will talk to the vegetable growers at their separate session Jan. 15.

William J. Dibble in New U.S. Borax Post

LOS ANGELES—Appointment of William J. Dibble to the newly-created position of director of marketing for United States Borax & Chemical Corp. has been announced by J. F. Corkill, vice president in charge of marketing.



William J. Dibble

Mr. Dibble formerly served as executive assistant to Mr. Corkill in the department which handles the sale and distribution of the company's borax and potash products for industry and agriculture.

A native of Kalamazoo, Mich., Mr. Dibble was graduated from Knox College and holds a master's degree in business administration from Harvard. He joined U. S. Borax in January, 1955.

Mr. Dibble began his sales career with Procter & Gamble Distributing Co. in Boston in 1939 and moved to San Francisco after World War II to join the Pioneer Soap Co. as sales and advertising manager. Subsequently, he was employed by Oronite Chemical Co. as manager of detergent products.

Three New Distribution Points Announced

HELM, CAL.—Three branch plants and distribution points have been or will shortly be opened by the farmer-owned Valley Nitrogen Producers, Inc.

The first of these opened in December is an aqua ammonia plant in Meridian, near Marysville, manufacturing that formulation, and distributing other products of the company in the upper Sacramento Valley region. Carl Peters has been named manager, having spent about 10 years with other fertilizer manufacturers in central California.

Scheduled to be opened during January is another aqua ammonia plant in Wasco, near Bakersfield, and a third branch in Clarksburg near Sacramento, also processing aqua ammonia. Ron Frazier will be manager of the Wasco plant, and Tom Lennon of the Clarksburg plant. Both men have had several years' experience in the industry.

The main plant, near Fresno, was opened during 1959 and manufactures ammonium sulphate, anhydrous ammonia, and related fertilizers, selling throughout California. Carl Haas is president, and Otto Haas is sales and distribution manager of the cooperative.

Regional Conference Scheduled in Oregon

PORTLAND, ORE.—A regional fertilizer industry conference, sponsored by the Pacific Northwest Plant Food Assn., has been scheduled for Jan. 12, at the Pendleton Hotel, Pendleton, Ore.

Included among the highlights will be discussions on "Influence of Residual Nitrogen on Wheat Yields," "Effect of New Varieties on Plant Nutrient Requirements," "Sulfur Trials on Wheat," "A Banker's Approach to Making Farm Loans for Fertilizer," and "Extension Programs That Promote Fertilizer Use."

F. T. Tremblay, regional director, National Plant Food Institute, will discuss "Recognize, Organize and Fertilize."

Washington Conference

PASCO, WASH.—The Annual Central Washington Fertilizer Conference will be held at the Mid-Columbia Junior College here, Jan. 25.

The program will be keyed to the needs of the marketing and distribution industry.

Here's a free double-barreled direct mail program that really brings the customers in... a tried and proven traffic builder... just stock 100 gallons of any combination of Monsanto weed and brush killers. Monsanto will send out two mailings to 100 of your top customers. The first mailing invites them to come into your store... the second mailing offers them a \$1.00 pack of farm utility needles absolutely free! You get 200 mailings and 100 of these useful needle packs at no charge.



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Monsanto Chemical Company, Organic Chemicals Division
Agricultural Chemicals Department, St. Louis 66, Missouri

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Adequate Fertilization of Crops Back of Today's Farm Efficiency

By Dr. Vincent Sauchelli*
Chemical Technologist, National Plant
Food Institute

HOW CAN one determine what efficiency has been gained in recent years in the production of crops? How has it been measured? If we know that, we may then analyze the situation to show the influence of commercial fertilizers in the achievement.

First in importance are the advances made in productivity. Farmers are in business to make a profit and what more effective way is there than by increasing the crop yields per acre? The U.S. Department of Agriculture furnishes numerous data illuminating this development.

One measure of productivity is the ratio of consumers to farm workers. Although not the most precise measure, it does help us to appreciate this situation. It shows roughly the number of persons supported by the production of one farm worker.

In 1904 the total persons supported by the production of one farm worker was 7; in 1940, it was 11; a gain of 57% in 36 years.

Total Farm Employment

1930	12.5 million
1957	7.6 million

Total U.S. Population

1930	123.1 million
1957	170.5 million

In 1954, the number was 18, a gain in 14 years of 63%; in 1958 the number was nearer 24, a gain of about 29% in four years. The rate of progress corresponds with the degree of efficiency gained. In the first period, 36 years (1904-40) the gain was 57%; in the second period, 14 years (1940-54) the gain was 63%, a larger gain in half the time; and in the last four years (1954-59) the gain was 29%. The pace quickens, owing to the operation of many improvements in managerial skills, mechanical equipment and the use of power in farm technology. For the period 1947-49, the average increase in all crop production for the country was 33% higher than in the period 1935-39.

How did fertilizer contribute to these increases in productivity? The record shows a dramatic expansion in the consumption of commercial fertilizers since 1935, as seen in the following tabulation. The period 1947-49—a peak period, is used as a base for index numbers.

Year	Plant nutrients (N, P ₂ O ₅ , K ₂ O) consumed (tons)	Index number (1947-49 = 100)
1935	1,216,000	31
1954-57	4,377,282	172
1957-58	4,512,387	172

Use of Fertilizer in East North Central Region

Year	Tons (N, P ₂ O ₅ , K ₂ O) consumed	Index number (1947-49 = 100)
1935	144,000	28
1954-57	1,505,000	213
1957-58	1,549,000	213
1957-58	Wisconsin 180,000	

We see how the gain in fertilizer consumption parallels the increase in acre productivity. The data from state and federal agricultural experiments are one in support of the thesis that the proper application of commercial fertilizers will substantially

increase yields, especially on impoverished soils. We can therefore take this viewpoint as almost a truism in applying it.

Farm output has increased each year since 1935 and it is expected to continue to rise. By 1958 it had increased to 20% over the year 1950 compared with 14% increase in total population for the same period. This was achieved without an increase in the acreage of cropland.

Crop production per acre in 1958 averaged about 10% higher than in 1957 and these years had an average increase of about 20% over that for the year 1950 and about 40% over 1940.

These crop production per acre increases were realized in all regions of the country but were greatest in the East North Central, the Pacific and the South Atlantic. In the East North Central region the average gain in output per man hour was 41% for the 10-year period 1947-57.

In this region the number of commercial farms has decreased owing chiefly to mergers or enlargement of the farms to justify use of new powered machines and higher rates of fertilization.

Up to 1915 most farmers used horses and mules and human muscle as power. It required 93 million acres of land to grow the feed for the total population of work animals; in 1958, only about 8 million acres or about 2% of the total cropland was required for present day population of horses and mules. Mechanization thus released about 85 million acres of cropland for use in growing commodities for man.

The record-equalling crop production of 1957 was realized with the smallest number of acres of cropland used for crops since 1917. In 1957 the cropland acreage was 2% smaller than in 1956.

Mechanization

At this point, it is proper to say something about the new technology on our farms. Mechanization is the order of the day. Between 1935 and 1950 tractor, truck and automobile practically eliminated the need for the labor of thousands of farm workers and that of the work-horse and mule. The result has been a tremendous gain in farm output per man hour. This is shown by the official data:

In 1935 the index of production per man hour, using the figures for 1947-49 as a base, was 58; in 1957, the index registered 154—more than three times as much crop production is now obtained from each hour of farm work as before World War II.

In order to meet the requirements of the new, tractor-drawn fertilizer distributors, the fertilizer industry developed new manufacturing processes and installed modern, chemical-engineered fertilizer plants capable of furnishing free-flowing, granulated fertilizers for precision application. In addition, it developed new processes and formulations to furnish products of double the plant nutrient

concentration of the conventional type of fertilizers.

The old standard grade 2-12-6 gave way to 3-12-12, 4-16-16, 16-8-8 and the 18-20% superphosphate has been superseded by 46% P₂O₅ grade. In short, the fertilizer industry in its role as handmaiden to agriculture rose to the occasion at great expense in time, energy and dollars to supply the kind and quality of fertilizers demanded by the new technology on the farm.

The average concentration of all fertilizers used in the U.S. is now 30.2%; in 1939 it was 20.3%. Nitrogen that at one time could be obtained in chemical compounds varying from 16 to 21% N, can now be also purchased as liquid nitrogen (82% N₂), urea, 42-45% N, ammonium nitrate 32-34% N, ammoniating solutions of varying N, content and ammoniated phosphates. Potash salts are purified to almost 100% as the chloride and sulfate salts.

Taken as a whole, these improvements in concentration of plant nutrients tend to lower the costs of handling, bagging and transportation and the savings thus achieved have been passed on to the farmer. The cost of fertilizer has advanced least among all the production factors purchased by the farmer.

Improved Plant Varieties

The plant breeder has been a significant contributor to the efficiency of modern farming. To him goes the credit for developing hybrid corn, and the other feed grains and crop plants of all kinds. These newer varieties have the capacity to produce higher yields. To enable them to produce at their maximum requires a high level of soil fertility and all the other sound practices of building and maintaining good, productive soils.

The fertilizer industry has provided high analysis fertilizers and materials as previously shown which are delivered at the farm at exceedingly low cost per unit of plant food. Hybrid corn alone has added the equivalent of about four to five million acres of rich land to the Corn Belt if we consider 75 bu. per acre as a good average yield (total added bushels, 300 million per year).

Commercial corn growers cannot be satisfied with low average yields of 60 to 70 bu. per acre. They have available hybrid corn capable of

yielding 200 to 250 bu. per acre but it must be fed adequately and given the other known cultural advantages in order to produce at a maximum per acre rate. It is just the same as in the case of the dairyman having a milk cow capable of giving 15,000 lb. of milk and 500 lb. of butter per year. Unless that cow gets the right diet in the right amount it will not produce to its full capacity.

Low-cost Plant Food

By making it possible to substitute low-cost nitrogen for legumes on many soils as a source of nitrogen for corn the fertilizer industry has made another contribution to efficiency in modern farming. It is now possible to grow corn after corn for many successive years on productive soils by using modern fertilizer at higher rates. A farmer now does not have to rotate and thereby withdraw from corn production certain well-suited fields; but, in addition, he can now farm soil not so well suited to corn but suited to other cereal grains, grasses, sod or trees. In this way fertilizer permits him to expand his enterprise, diversify his crops and make a larger net profit and still conserve his soil.

Despite the proven fact that it pays well to put on the fertilizer, it is still true that many farmers in all regions of the country are not applying fertilizer at the higher rates recommended by their local agricultural authorities to increase per acre profits. Here is what the USDA points out in its bulletin, "Substituting Fertilizer for Land in Growing Corn":

The amount of fertilizer applied per acre could be tripled, says the USDA, before the point of minimal total cost of production per bushel would be exceeded.

The economists at the USDA estimate our nation will require a total of some 4.3 billion bushels corn by the year 1975. This goal is feasible and will be reached when necessary, thanks to the contributions of scientists, the plant breeder, farm equipment manufacturer, pesticides and that indispensable factor, high analysis commercial fertilizer.

Newer Concepts of Soil and Water Conservation

An abundant supply of low-cost-per-unit of plant food has been made possible by a modernized, efficient fertilizer industry and it permits farmers to increase yields, lower their crop unit cost of production and increase net profit. Fertilizers and lime are applied to realize the most profitable and efficient production levels per acre rather than to make a large percentage return on the dollar invested.

This development has had and is having an agreeable impact on the concept of soil and water conservation. Until very recently the emphasis of soil conservationists was to use sod or a close growing crop for the purpose. Now it is realized soil

Index Numbers of Cropland Used for Crops and Crop Production per Acre, U.S.A. 1947-49=100

Year	Cropland Used for Crops	Crop Production Per Acre
1930	101	75
1940	97	88
1950	100	97
1955	99	106
1956-57	97	109
1957-58	95	112

Source: USDA Statistical Bulletin No. 233, August, 1958.

Use of Fertilizer in Terms of N, P₂O₅, K₂O 1947-49=100

Year	U.S.A. & Territories 1,000 Tons	Index No.	E. No. Central Region 1,000 Tons	Index No.
1930	1,524	42	164	23
1940	1,366	48	220	31
1950	1,413	120	870	123
1955	6,104	167	1,457	206
1956-57	6,055	167	1,426	202
1957-58	6,370	172	1,508	213

Source: USDA, Stat. Bull. No. 233, August, 1958

Index Numbers of Farm Production Per Man Hour U.S.A., 1947-49=100

Year	Farm Output	Milk Cows	Hay & Forage	Feed Grains	All Crops
1935	59	70	59	46	58
1940	70	77	64	56	69
1945	86	89	81	76	86
1950	112	107	119	122	115
1955	132	119	126	162	135
1957	143	122	135	186	154

*Presented at Wisconsin Lime & Fertilizer Dealers Meeting, Dec. 8-10, University of Wisconsin.

Region	Acres Fertilized	Percent of Total Fertilized	Plant Nutrients Applied per Acre Fertilized
Lake States	6,000,000	59%	67 lb.
Corn Belt	21,000,000	64%	79 lb.
These two regions..	27,000,000	63%	77 lb.

and water conservation depends more upon the management practices used on the land than upon the particular crop grown. This is especially so on those lands that are flat or only slightly sloped. A corn crop grown on such land under soil conditions of high fertility derived from applications of high-grade fertilizers and the incorporation of plant roots and top residues, will do as good if not a better job of soil building, to permit soaking in of rainfall, than soil or close growing crops. It has been proved in this region that soil can be improved greatly in structure and fertility under continuous corn, if it is fertilized at the recommended higher rates and the plant residues plowed under.

Fertilizer Institutes

The fertilizer industry has invested and continues to invest annually huge sums of money by individual companies and collectively to foster research on soil science, soil fertility and farm management problems for the purpose of aiding farmers to maximize their acre yields and net profits. The National Plant Food Institute and The American Potash Institute are two organizations, established and supported by the fertilizer industry to serve the best interests of American agriculture in cooperation with all the agencies of the land grant colleges devoted to the same purpose.

Although the prime objective of these institutes is to expand the market for fertilizer, they do this on a scientific and lasting basis. They believe strongly that new potentials for fertilizer sales must be developed through the intelligent research in soil-plant relationships and in the economics of fertilizer use. Some of their research activities supported through grants-aid to agricultural colleges involve studies on soil-water relationships, forest fertilization, methods of teaching soil fertility to vocational students, sponsoring demonstrations on a county basis of intensified soil fertility programs, distribution of films, motion pictures, leaflets, posters, booklets and a host of other activities grouped under the general class of public relations. The results of many of these general and specific activities are reflected in the steady increase in the productivity of our soils and in higher per acre returns on most of our commercial farms.

These activities I judge should be included among the contributions made by the industry to increase the efficiency of American farming.

Grassland Farming

We shall conclude with a reference to the fertilization of grassland. An increasing number of dairy farmers in the Northeast especially have learned it is profitable to fertilize improved varieties of grasses for the purpose of getting high quality forage at low-cost per unit of protein. Nitrogen is the key element. The national capacity to produce synthetic nitrogen compounds is more than adequate to meet all demands for this element. The abundant supply of low cost nitrogen is causing a definite change in the thinking of dairymen regarding home-grown forages. The fertilizer industry in this case also is contributing to efficiency and therefore to profits on the farm. It is able to furnish not only all the nitrogen needed but the other equally essential nutrients in the fertilization program—the phosphorus, potassium, calcium, magnesium and sulfur. Any one of these elements can become the limiting factor in yields unless present in proper quantity re-

lation to the other essential plant foods.

Your own agricultural college authorities have been preeminent in pointing out the present day opportunities for increasing profit on the dairy farms of Wisconsin by taking advantage of the abundant, low-cost supplies of all the needed fertilizer elements offered by the modern fertilizer industry. In fact the leadership in this field developed by your authorities has definitely influenced the thinking of scores of grassland farmers beyond the borders of this state. The fertilizer industry appreciates and welcomes such farsighted cooperation.

To illustrate the situation, I would like to refer to a situation in New York state reported by Dr. Howard B. Sprague of Pennsylvania State University. He said, "Forage is a dominant factor in the agriculture of the Northeast but this fact is not fully realized by farmers and their advisers. The thinking too often centers around grains and concentrates on about 5½ times as many dollars for feed as for lime and fertilizers." In the light of the proven savings in home grown forages, what is the explanation for this continued situation throughout the dairy industry of the Northeast? But this is beyond my field. Your own specialists have been preaching this same story for years. It is worth emphasizing again and again. The feed people would not suffer as a result of its general adoption.

The management of grassland is an art: fertilization should include the minerals, phosphorus, potassium, calcium, magnesium and sulfur, as well as nitrogen and it will have to be integrated with a proper grazing management. Excessive nitrogen where continuous grazing is practiced has led to tetany or so-called "nitrogen sickness." More of this grass tetany application seems to occur in some European countries than in ours. But it can and does occur here also where magnesium seems to be deficient.

Andre Voisin, an eminent French authority both as scientist and dairyman, in a remarkably good book recently published in English translation, said this: "I do not think our methods of grazing management have improved for 6,000 years. The reason is that in our studies and researches on pasture lands we have neglected the question of grazing management and we shall make no progress as long as this continues to be the case." He stresses the difference between "grassland management" and "grazing management."

Oregon Fertilizer Conference

CORVALLIS, ORE.—The annual Western Oregon Fertilizer conference, co-sponsored by the Pacific Northwest Plant Food Assn. and Oregon State College, will be held Thursday, Jan. 14 in Withycombe Hall, on the OSC campus.

Subjects to be discussed are as follows: Liability Products Insurance; Bankers Role in Financing Fertilizer; New Developments in Strawberry Fertilization; Molybdenum and Live Studies; Making the Most of Your Advertising Dollar; What the College Is Doing on Soil Testing and a panel discussion on forage crops.

AMMONIUM SULPHATE SHIPPED

SEATTLE, WASH.—Further shipments of ammonium sulphate have been made out of the Port of Seattle. The first cargo of ammonium sulphate, used as fertilizer, went aboard the S.S. Santa Rosa in November. The S.S. Ridgefield shipped the second 10,000 ton cargo of ammonium sulphate out on Dec. 20.

\$150 Million Annual Texas Cotton Loss Attributed by Scientists to Crop Diseases

COLLEGE STATION, TEXAS—Texas cotton growers each year lose nearly \$150 million because of crop diseases, according to Dr. Luther Bird, plant pathologist at the Texas Agricultural Experiment Station, who addressed members of a cotton chemical conference at Texas A&M.

This loss is figured on fiber yield only, but if all diseases were considered the amount would reach \$200 million annually. Dr. Bird says prevention is better than cure, because once a disease gets started in any one season, it is extremely hard to control the remainder of the year.

The solution to these diseases is not so simple, because there is no remedy for some of them. High applications of nitrogen fertilizer will sometimes help in resisting blight, but this is not always economically practical.

Seedling diseases take a big toll of the yield. Growers should plant only good seed, Dr. Bird said, and these seed should be chemically treated, not planted too early, and then not over 30 lb. to the acre. The farmer should also mix fungicides into soil covering when planting.

Another speaker, Dr. W. O. Trogdon, head of the A&M department of agronomy, said the right kind of fer-

tilizer should be used for cotton. He said it was generally best to spread fertilizer applications out over the growing season instead of putting it all on at once.

A third specialist, Fred Elliott, cotton works specialist with the Texas Agricultural Extension Service, told the group that pre-emergence chemicals for cotton probably do not have much of a future, although some farmers had used the system successfully.

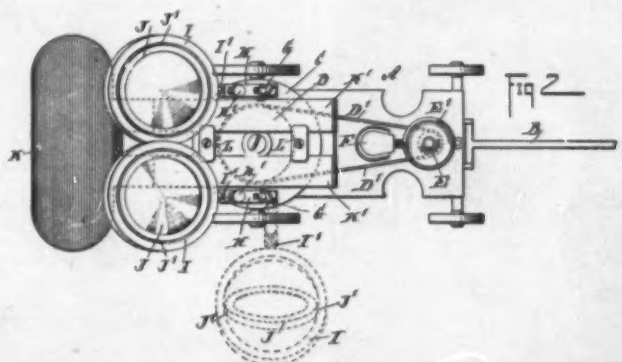
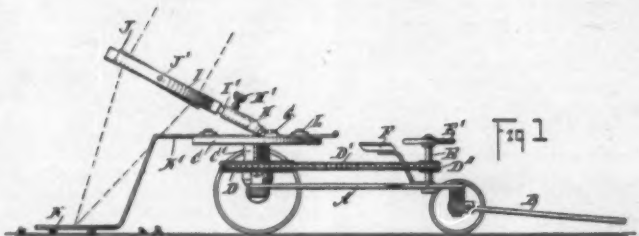
Best Fertilizers

Announces Reorganization

OAKLAND, CAL.—Lowell W. Berry, president of the Best Fertilizers Co., has announced the reorganization of the Best lawn and garden division, which has been expanded to include a full line of lawn and garden insecticides.

Jack O'Connor, of Oakland, assistant manager of this division, reports directly to David M. Sansome, divisional vice president. Clayton Church, of Richmond, is district sales manager for the bay and coastal areas, while John Thornley, of Sacramento, heads the Central Valley area.

Saga of Insect Pest Control



A HOT TIME was in store for insect pests around 1898 when Victor Rieke, of Franklin, Minn., patented an insect-exterminator device calculated to burn pests right on the ground, via heat generated from concentrated rays of the sun. Mr. Rieke's device employed a principle similar to that of passing a hot pressing iron over an area, thus sizzling any insects inhabiting the surface of the ground.

The source of heat was very inexpensive . . . in fact, free . . . providing the sun was shining. Mr. Rieke conceived of having two strong glass lenses so arranged over a metal plate that the rays of the sun would heat the metal to a high degree. The plate, in turn, was to be oscillated back and forth as the vehicle was pulled along by horses.

The illustrations above, taken from the original patent, illustrate the general workings of the insect-killer. Above is a sectional side elevation of the machine, showing the concentrating lens (J) and the heat-plate (K). The hand-wheel (E) was used to adjust the lenses to conform to the sun's position and to get maximum heat from the rays.

The lower drawing pictures the machine as seen from above, showing the position of the lenses, the plate, and the different positions the lenses may assume. An added feature of the insect killer, the inventor said, was its ability to burn out stumps by concentrating the sun's rays on the wood and setting it afire. Matches, it appears, were scarce in those days.

SURVEY

(Continued from page 1)

TABLE 1

Estimated Total New England Non-Farm Home Fertilizer Consumption by Type Vegetation, Year Ended June 30, 1959

Vegetation	Percent of Total Reported	Estimated Tonnage
Lawns	57.1	30,700
Flowers	11.4	6,100
Vegetables	24.7	14,300
House Plants	0.3	200
Shrubby	2.7	1,400
Trees	1.8	1,000
Total	100.0	53,700

poses during 1954. This was a calculated figure based on the 1954 Census of Agriculture and U.S. Department of Agriculture estimates of consumption for all purposes.

A sample survey, conducted in 1956, indicated that average consumption per private household in New England was around 45 lb. This would have meant that total consumption by non-farm private households in the six-state area that year was about 58,500 tons.

However, these results were based largely on a practically complete survey of a single community—Winsted, Conn.—and a sample drawn from New Haven, Torrington, and Guilford, Conn., and a number of other smaller communities in Massachusetts and Connecticut, which together were thought to be representative of the whole New England region. The results of the present sample survey are considered to be more representative of the actual situation, because they have made it possible to more accurately reflect and analyze the various factors affecting consumption. Nevertheless, it should be noted that the 45-pound-per-household av-

erage from the earlier study is within the range of the calculated standard error (37.9 to 45.1) determined from the new study.

It is likely that the total consumption of fertilizer in the region during 1958-59—both farm and non-farm—was about 450,000 tons. This would mean that lawns, gardens and house plants accounted for about 12% of the total.

Of the mixed fertilizers, the most popular grade by far turned out to be 5-10-10, which accounted for nearly one-fourth of the total home consumption.

Of the total, only about one-eighth was of organic origin—primarily dried animal manure, activated sewage sludge and process tankage. Straight materials, such as ammonium nitrate, sodium nitrate, urea and superphosphate, accounted for less than two percent of the total.

Nearly one-fifth of all families interviewed had used more than one kind of fertilizer during the year. It was also found that much of the specialty fertilizer applied to shrubbery was of acid reaction.

Before this survey was made, it was assumed that all cities in a region of about the same size would have approximately the same mean rate of consumption per home. As the sampling proceeded, however, it became apparent that this assumption was not uniformly correct. The original plan was to have only one or two cities of each size group represented in the sample by a number of homes equivalent to its proportion to the total population. This plan was subsequently changed to include as many localities as possible—even though this meant a smaller sample in each locality—and to attempt to include the different types of localities in about the proper ratio.

The effect of community size on consumption presents a somewhat different picture than the earlier study for the U.S. as a whole. In New England, the mean seems to increase from around 4 lb. a home in Boston to around 80 lb. a home in the smaller communities.

In New England, the more-or-less continuous decrease from the smaller to the larger communities is interrupted in the 25,000 to 50,000 size class. A larger sample might have given a more continuous progression. However, there is good evidence for believing that this deviation in the 25,000 to 50,000 size group is real.

Of the 26 incorporated cities with 25,000 to 50,000 population in New England, seven are a part of the Boston metropolitan area, and one is a part of the Providence metropolitan area. Also included in the Boston area are four unincorporated urban communities in this size group, while the Providence area also includes one such community.

Most of these communities in the Boston and Providence areas consist principally of detached homes. A relatively larger proportion of the New England cities with less than 25,000 inhabitants are independent communities with all classes of dwellings—apartments and row houses as

well as detached homes. Thus, it seems reasonable to assume that mean consumption in the 25,000 to 50,000 class should be larger than for the next two smaller classes.

As a matter of fact, the data from the survey seem to show that consumption of fertilizer by private households is closely related to the number of detached homes in the community.

Illinois Announces Fertilizer Conference

URBANA, ILL.—The 1960 Illinois Fertilizer Industry Conference has been set for Feb. 4 at the Champaign County Country Club in Champaign.

According to S. R. Aldrich, University of Illinois agronomist, two featured topics have been scheduled for the one day program. University of Illinois research workers will discuss "Limiting Factors in Corn Production." This will include water use, light, fertility and plant populations. Dr. M. B. Russell, head of the department of agronomy, will address the group on "Research for the Future."

The Illinois Fertilizer Industry Assn. will also hold a business meeting. Registration is scheduled for 9:30 a.m. Sessions will run through the morning, afternoon and evening. Further details of the program can be obtained from S. R. Aldrich, chairman, 211 Davenport Hall, University of Illinois, Urbana.

All fertilizer manufacturers and manufacturers' representatives are especially invited to attend this conference sponsored by the University of Illinois department of agronomy. This meeting follows the Agricultural Industries Forum on the University Campus, Feb. 2-3.

Nine Secondary Elements Okayed for Fertilizer Use

SALEM, ORE.—Nine secondary elements may be included in fertilizers offered for sale or sold in Oregon after Jan. 1.

The State Department of Agriculture says when such elements are used they must meet minimum units now established by the department and when claimed, the label must list the name and amount of the secondary element.

Elements authorized for use and the minimum amount which will be recognized are: calcium, 1%; magnesium and sulfur, each 0.5%; copper, iron and manganese, each 0.1%; boron, molybdenum and zinc, each 0.01%.

After Jan. 1 the state will analyze against the secondary element label claims the same as it does for the primary elements, according to J. D. Patterson, the department's chief chemist.

The order establishing the secondary elements in the fertilizer guarantee follows a public hearing held recently.



Gilbert N. Rhodes Dr. W. D. Bishop

APPOINTMENTS—Gilbert N. Rhodes, associate agronomist, University of Tennessee agricultural extension service, has been promoted to the position of agronomist, and will be leader of extension agronomy work, according to an announcement by Webster Pendergrass, dean of agriculture. Mr. Rhodes takes the place of Dr. William D. Bishop, recently named leader of agricultural programs for extension. His promotion was effective Dec. 1.

CONFERENCE

(Continued from page 1)

compared between bulldozing and hand labor as against the expense of chemical application in establishing wildlife clearings.

Products showing the most effectiveness were those which acted quickly to kill a greater proportion of the tree species, and those which could be transported into relatively inaccessible areas in knapsacks with no other application equipment being necessary.

Treated areas can be left until the stems have partially decayed, the paper said, and the stems may be removed later or left undisturbed if desired. "A considerable number of annual and perennial plants invaded these areas during the first growing season after treatment. Oak and sassafras seedlings were present in limited numbers," they reported.

The authors said that because of the great number of sprouts produced by use of one herbicide, it was indicated that this method of treatment might be used to produce browse in areas where it is desired, but because the original stems must be frilled and treated or cut and stump-treated, such chemicals would be used only on a limited scale.

"Herbicides as a wildlife management tool show great promise for creating wildlife clearings and controlling undesirable tree and shrub species. It is improbable that they will replace bulldozing as a method of creating clearings, however," the authors commented. Determining factors will be a decision on what is desired to be accomplished and the accessibility of areas, they added.

A progress report on chemical weeding of sweet corn was presented by C. J. Noll, assistant professor of olericulture, Pennsylvania State University, University Park, Pa. He said that although chemical weeding in sweet corn is not new, a number of obstacles have yet to be overcome. Among these are occasional injury to corn and the fact that not all of the weeds are killed.

However, new chemical products and combinations of different materials have shown more promise during experiments made during the past season, he said. Pre-emergence applications of herbicides were made on May 20, the day after seeding, he explained. Emergence treatments were made six days later when the corn was just coming through the soil.

Chemicals were applied at two rates each; usually at what was thought to be the best rate, and another, one half or two times this rate. All but three chemicals increased the weed control significantly, as compared to the check plots. In all, eleven separate products were involved in the tests, but the number of tests was greater because of applying the herbicides in various combinations.

T. R. Flanagan, Vermont Agricultural Experiment Station, Burlington, Vt., told about the influence of pre-emergence weed control on corn grown under conditions of drought. He pointed out that yield decreases in corn are more pronounced with failure to control weeds during the first few weeks of corn growth and that aggravated weed competition for soil moisture occurs under dry season conditions.

Three herbicides were applied to corn plots, and good residual weed control lasted throughout the season with two of the products. The other allowed weeds to grow, a fact which was reflected in corn heights and yields in great contrast to corn growing where such weed competition had been eliminated.

Opportunity was given to herbicide manufacturers to "unveil" new products at the Northeastern Weed Control Conference. This portion of the conference was in charge of Dr. Charles L. Hovey, Eastern States Farmers Exchange, West Springfield, Mass.

At your service . . .



Tom Letch put aside his editor's cap with a weekly newspaper in a farming community to join the staff of The Miller Publishing Company. His grass roots knowledge of farming and agricultural marketing gives him a practical approach to the problems that may be confronting you.

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TO WORK closer with the small farmer and to keep him fully posted on what is going on, Farm Store, Inc., Jonesville, Va., has installed modern mailing equipment. An employee prepares to operate the envelope addressing machine.

Improving Collection Methods From Your Credit Selling

By CLYDE WILLIAM PHELPS
Professor of Economics
University of Southern California

Past-due accounts are a common problem encountered in businesses that sell on credit, as many firms—even small firms—do nowadays. Poor collections eat into profits in many different ways. If you feel that you are not getting the collections you should or as fast as you might, a little time spent on checking the possible causes and considering effective solutions may yield handsome returns.

Collections and Credit Granting Efficiency

The place to begin looking for possible causes of collection difficulty is not in your collection setup but rather in your credit granting policies and procedures. There is a saying that an account properly opened is an account half collected. Poor collections may be due to inefficiencies that occur in the credit granting part of your operation before your collecting activity even starts. Hence it is desirable to check the following important factors in your credit granting mechanism to discover whether there are any weaknesses.

1. Are you selecting your new customers carefully after thorough credit investigation? If you are granting credit to applicants who are known to others (as shown by credit bureau

records) as slow-pays or won't-pays, how can you expect anything but poor collections and bad-debt losses? When credit investigation is inadequate, poor accounts are put on the books to start with; often the account which turns out to be a problem was already a poor risk at the time it was opened.

2. Are you making sure that each applicant and present customer clearly understands your credit terms? Your credit terms should be stated clearly to each applicant at the time his account is being opened. They should be restated on your invoices or sales checks, on your monthly bills or statements of account, and on your collection notices. How can you expect good collections from a customer who never clearly understood, or has forgotten, just when he is supposed to pay?

3. Are you controlling the credit limits you set for your various customers? Customers who are allowed to exceed sound credit limits (based upon their ability to pay) become overloaded, and their accounts are certain to turn into collection problems or bad-debt losses.

4. Are you sending statements promptly? It is an old saw, but it is still true that the early bird gets the worm. People generally tend to pay first those bills that reach them first.

(Turn to COLLECTIONS, page 17)

SUMMARY

Most businesses face collection difficulty at one time or another. Not all men are honest; not all men are cautious in their purchases. That means that you need a collection system that works.

In such a system, four main areas demand special attention: (1) greater efficiency in credit granting; (2) increased precision in the collection policy; (3) more automatic operation in the collection system, and (4) improved timing in the collection procedure.

Of course, even a system need not and probably should not be totally impersonal. At times you may have to guess who among the customers who cause collection problems are unwilling (but able) to pay, and who are both unwilling and unable to take care of their commitments. Obviously, you should apply different collection tactics in each case.

But without a definite and established collection procedure, you may find yourself in an uncomfortable position. You need not let that happen: A little planning can save you a lot of grief. (This article is presented through the cooperation of the Small Business Administration.)

'Need Closer Dealer-Farmer Relationship,' Virginian Says

By ROBERT H. BROWN
Croplife Special Writer

There is today a need for closer relationship between the dealer and the small farmer for more reasons than one. Some important changes are taking place in farming and the farmer needs the practical assistance that can come from a merchant, according to O. M. Hyatt, general manager of Farm Store, Inc., Jonesville, Va.

"We're working with him closer today than at any time in the years we have been in business," he said.

The farmer Mr. Hyatt has reference to is the fellow who runs a small farm on what possibly used to be a part-time basis, while he held down another job. Or it may be a farmer who has made a living on a small farm all of his life.

"But mainly I'm referring to the man who has a few acres and has been holding down a 40-hour work week job, or less. He has had a lot of time on his hands and he could manage very well . . . while he had the full-time job. As everyone in the business knows, there's been a lot of this kind of farming the last few years. It's been part of a trend toward country living, while working at a factory or a coal mine. Since he had a salary coming in he didn't have to depend on the farm for a living. What he made, if actually anything, from the farm was clear profit. The point I'm making is that he didn't have to depend on the farm," he said.

"Now then here's the possible picture with a lot of these small farmers," says Mr. Hyatt. "For some reason or other he has decided to farm full-time. Maybe the factory has closed; maybe the coal mines have closed down. He's thrown out of work. He's liked farming the small acreage on the side and he decides he is going to chuck the full-time job and spend all of his time farming."

"This is the fellow who today needs assistance from the farm store and needs it badly and it is to the advantage of the merchant and the farmer to work together very, very closely."

"The farmer has had more than enough money to operate the place with his weekly salary coming in, but now that he has either voluntarily or involuntarily lost that income, it's no longer there. His sights are still pretty high, financially, on how much he should spend and what he should do."

"He reads a lot of bulletins and a lot of literature on farming, mechaniz-

(Turn to RELATIONSHIP, page 14)



"WE MUST WORK closer than ever before with the small farmer and try to help him with his problems and his finances," says O. M. Hyatt, general manager of the Farm Store, Inc., Jonesville, Va.



By Emmet J. Hoffman
Croplife Marketing Editor

OVER THE COUNTER

Dealers occasionally hear the opinion expressed that concentration of ownership of rural land is making startling progress.

This is not so, judging from a U.S. Department of Agriculture survey. Concentration of ownership of rural land in 10 Great Plains states, containing 47% of the farm and ranch land in the U.S., did not change appreciably between 1945 and 1958, USDA says.

Further, the study shows that individuals, as opposed to corporations, own the vast majority of privately held farms and that husband-wife combinations—the dealers "bread and butter" customers—continue to be the most common type of owner.

Even though there were fewer owners and the average size of ownership unit was increased, the proportion of land held by both small and large holders was about the same in 1958 as in 1945.

The 50% of the owners holding the smallest units of land own 8% of the

acreage and 11% of the value of farm and ranch land in the ten states. Owners of the largest holdings, at the other end of the scale, number 5% of the total; they control 53% of the acreage and 36% of the land in terms of its value.

The study revealed an increase in the average size of ownership units (defined as single owners, husband

(Turn to OVER THE COUNTER, page 11)

WHAT'S NEW

IN PRODUCTS • SERVICES • LITERATURE

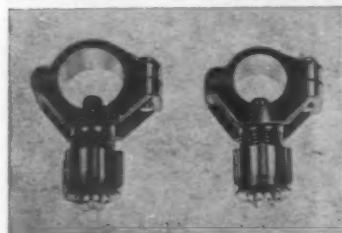
To obtain more information about items mentioned in this department simply: (1) Clip out the entire coupon in the lower corner of this page. (2) Circle the numbers of the items of which you want more information. Fill in the name and address portions. (3) Fold the coupon double with the return address portion on the outside and fasten the edges with a staple, cellophane tape or glue. (4) Drop in the mail box.

No. 6005—Sprayer, Duster Catalog

A 28-page illustrated catalog containing information about sprayers, dusters and allied products, has been released by Universal Metal Products Co., division of Air Control Products, Inc. The catalog contains information about operation of a number of company products, with specifications, illustrations and uses of each. For copies of the catalog, check No. 6005 on the coupon and mail to this publication.

No. 6003—Nylon Eyelets

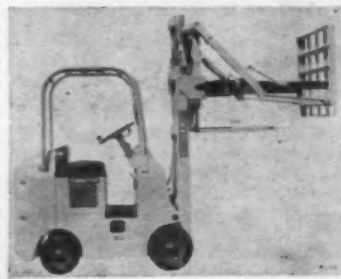
Delavan Manufacturing Co. announces that it has started making eyelets of nylon, because nylon offers resistance to corrosive effects of agricultural chemicals. According to company literature, the eyelets are simple to install on the boom and



have only one cap screw to tighten. A positive Hycar washer makes installation leakproof, the company says. They can be installed in production by drilling or punching an 11/32 in. hole in the boom. For more information, check No. 6003 on the coupon and mail.

No. 6000—Fork Lift Truck

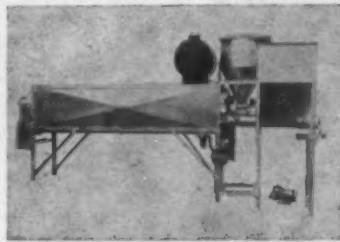
Towmotor Corp. announces the Model 461 fork lift truck. The unit is equipped with a hydraulically-operated "Unloader Accessory" which the company says speeds up loading operations and the deposit of heavy loads in warehouses and storage areas by "pushing" the entire load from the



lift truck forks with one motion. The wheelbase is 46 in. Accessory does not interfere with the normal operation of the lift truck, the company says. For details, check No. 6000 on the coupon and mail.

No. 6002—Seed Treating Machine

A new version of the Kromer "Uniform Coat" seed treater, featuring sectionalized construction, has been announced by O. W. Kromer Co. The unit utilizes sectionalized construction for flexibility, economy and operating efficiency, the company says. The method consists of feeding a continuous stream of seed



into a slowly revolving mixing chamber where the seed is sprayed. Then the seed passes through a cloud of chemical dust in the mixing chamber. As the seed is mixed, the dust adheres to the moistened seed. When the seed is coated all liquid is absorbed and the seed picks up no more dust. It is capable of processing up to 18 tons of seed per hour, the company says. For more information, check No. 6002 on the coupon and mail.

No. 6004—Boomless Type Sprayer

A boomless type sprayer (Model No. 630-L) that permits the operator to control each of its two jet nozzles independently from the tractor seat has been announced by Century Engineering Corp. The sprayer is equipped with a 44 in. aluminum gun on a swiveling, telescoping stand. The



driver can spray to one or both sides by turning the control handle. Extra nozzles are provided so the gun can be used for regular hand gun spraying purposes. For details, check No. 6004 on the coupon and mail.

No. 6994—Boron Guide

"Guide for Use of Boron Fertilizer" is the title of a publication made available by U.S. Borax & Chemical Corp. The guide is designed to be helpful in calculating the amount of fertilizer borate or "Solubor" equivalent to definite recommendations in terms of borax for many crops. For copies of the guide, check No. 6994 on the coupon and mail.

No. 6999—Weed Killer Chart

A wall chart which outlines recommended weed control methods has been published by Stauffer Chemical Co. Included are data on major crops, chemicals, application rates and weeds controlled. Sections are also allocated to the control of resistant weeds and brush along fence rows, ditches, roadsides and aerial application methods for treating sage brush, mesquite, shinnery oak, post oak and blackjack oak. For copies, check No. 6999 on the coupon and mail.

No. 6997—Centrifugal Pump Bulletin

An illustrated four-page case-history bulletin on the application of Thermo-flow 100, reinforced polyester molding compound, in a centrifugal pump garden sprayer, has been released by Atlas Powder Co. Constructed principally from molded polyester parts, the pump is used in conjunction with a 10-gal. mobile sprayer for insecticides, liquid fertilizers and other sprays. Thermo-flow 100 provides resistance to all types of chemical sprays, the company says. The pump has only one moving part, an impeller, which is coupled directly to output shaft of the engine. For more information, check No. 6997 on the coupon and mail.

No. 6001—Economy Sprayer Model

John Bean Division of Food Machinery and Chemical Corp. announces the economy Model 275 C.P. sprayer. Features of the unit include a four cylinder, 70 h.p. engine, convenient controls, a choice of two pumps, unitized frame and tank and specially designed nozzles, the company says. The unit equipped with the company's Royal 25 high pressure pump delivers 24.7 gpm at 400 psi. Equipped with a company self-priming, centrifugal pump it has a capacity of 50 gpm at 55 psi. It is designed for the small or medium sized orchard and can be equipped with a 300 or 400 gal. tank. For details, check No. 6001 on the coupon and mail.

No. 6998—1960 Sprayer Line

Hahn, Inc., announces nine Hi-Boy self-propelled, high-clearance sprayer models for its 1960 line. The units are designed for application of liquid fertilizers, for weed control and for spraying of crops through every stage of growth, the company says. All machines feature rustproof aluminumized-steel tanks and booms. Improvements in the model illustrated (H-300) include boosting the horsepower to 30 and the maximum speed to 20 m.p.h. The company also increased the tank capacity to 200 gal. More details can be secured by checking No. 6998 on the coupon and mailing to this publication.

No. 6996—Pail Rack

Hub States Chemical & Equipment Co. announces a method of dispensing liquids from 5 gal. containers. Called the "Pour-Easy" pail rack, the unit provides a means of dispensing from this size container. The balanced container eliminates waste by spilling, the company says. Clamping of the



band is performed by tightening a plated wingnut. For details, check No. 6996 on the coupon and mail to this publication.

No. 6993—Drum Tilter

Pucel Enterprises, Inc., announces the "Grizzly Roto-Tilt" for lifting and tilting steel and fiber drums for pour-

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☐ No. 6993—Drum Tilter
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☐ No. 6997—Centrifugal Pump Bulletin

- ☐ No. 6998—1960 Sprayer Line
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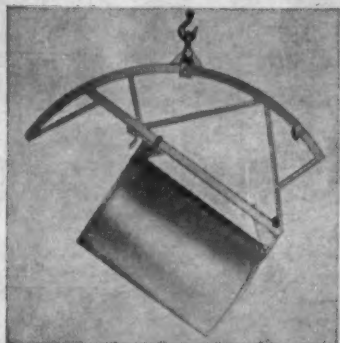
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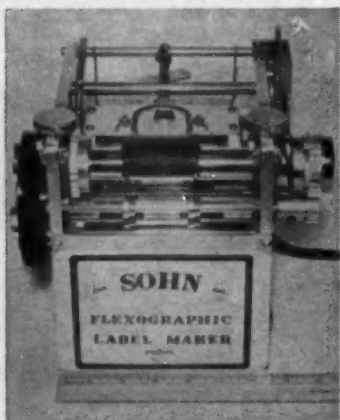
ing and dumping powders, granules, chemicals and other materials. It is a one-man operation, the company says, and can be used with fork truck, chain falls, chains and hoists. Works on old and new steel and fiber



drums, containers, barrels and boxes, closed or open, battered or lopsided, the company says. It weighs 60 to 80 lb., depending on the model, and has a lifting trolley with ball bearings, safety locking bracket with serrated jaws for attachment on top rim of drum, and a recessed foot plate to hold drum bottom. For more information, check No. 6993 on the coupon and mail.

No. 6992—Label Maker

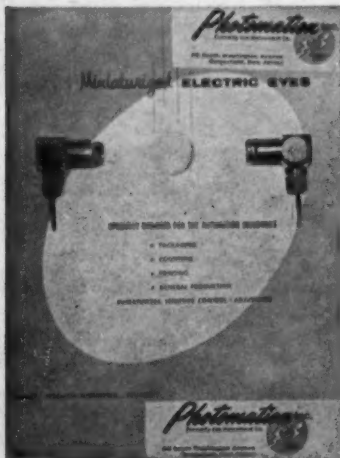
Sohn Manufacturing, Inc., announces a flexographic printing press which prints and diecuts on pressure sensitive label paper, or score cuts on gum, heat seal or plain paper.



Size is 9 in. by 9 in. by 9 in., without the guard case. Weight is 40 lb. It prints 6,000 labels an hour, and colors and printing plates can be changed in seconds, the company says. For further details, check No. 6992 on the coupon and mail.

No. 6991—Electric-eye Manual

A 16-page booklet describing in detail miniaturized electric-eye applications for counting, sorting, monitoring, assembling and automatic weighing as applied to packaging.



printing and general promotion, has been announced by Photomation, Inc. The equipment described in the manual ranges from direct or partial cut-off to reflector type units. It contains an expanded section dealing with specific in-plant installations. Technical and specification data includes dimensions, circuitry, speed, monitoring and relays. For copies check No. 6991 on the coupon and mail.

No. 6995—Insect Control Booklet

A 10 page booklet entitled "Better Control of Insects in Stored Grains" has been published by Stauffer Chemical Co. Among subjects discussed are sanitation methods, grain protectants and fumigants. A feature is a wall chart which includes identifying sketches of principal stored grain insects. For copies of the booklet and chart, check No. 6995 on the coupon and mail.

OVER THE COUNTER

(Continued from page 9)

and wife, partnership, estate, institution, or corporation) from 570 acres in 1945 to 643 acres in 1958, with no significant change in the total area of agricultural land. The 1958 total of ownership units was estimated to be 830,000, with at least 1.4 million persons having some direct ownership interest in the rural land of the 10 states covered.

The states are North Dakota, South Dakota, Nebraska, Kansas, Oklahoma, Texas, Montana, Wyoming, Colorado, and New Mexico. The 708 million acres of land in them is 37% of the total area and 47% of the farm and ranch land area of the U.S. About 550 million of the 708 million acres are devoted to agricultural uses.

Proportions of rural land in public and private ownership vary considerably in the 10 states, the study showed. In New Mexico 41% is pri-

CROPLIFE, Jan. 11, 1960—11

vately owned, and in Kansas 99% is privately owned, with the average for the 10 states totaling 75%.

The survey indicated that ownership of the privately held land is widely distributed. Fewer than 1% of the owners of farm and ranch land in the 10 states are corporations, although the corporations own a total of 8% of the privately held land. Much of this corporation land is low in productivity—like grazing lands.

Individuals, as distinct from corporations, own 89% of the grazing land and 96% of the cropland in the 10 states. Because ownership of the more productive land rests largely with individuals, the corporations own slightly more than 2% of the land measured in terms of its value.

Husband and wife combinations are the most common type of owner, the study showed. They own jointly or separately 49% of the farm and ranch land. Partnerships other than husband and wife control another 20%, and single men and women own another 17%.



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ON FORAGES—Only a fraction of America's forage crops get any fertilizer at all. Even though more than half the total land area of the United States (about 1 billion acres) is in pasture and grazing lands. Virtually none is fertilized adequately. Even though plant food on pasture pays. On hay, too. Farmers will start using fertilizer only when someone convinces them, proves it will be to their advantage. Potash Institute agronomists are working at it side by side with USDA and college agronomists coast to coast.



ON FORESTS—A new field for plant food use. Still in its early stages of development, forest fertilization shows promise of becoming a standard practice, requiring many thousands of tons of plant food. Potash producers have pioneered in the study and development of this new potential. Potash Institute agronomists have traveled at home and abroad gathering firsthand information for the fertilizer industry.



ON LAWNS—All over America, suburban developments with new homes and new lawns sprawl cross-country. This is prime fertilizer sales territory! And it's growing. Five Potash producers, through their Institute, are helping translate this growth into plant food sales. A special Institute handbook on lawn fertilization was recently published. Requests for it average over 1,000 a week.



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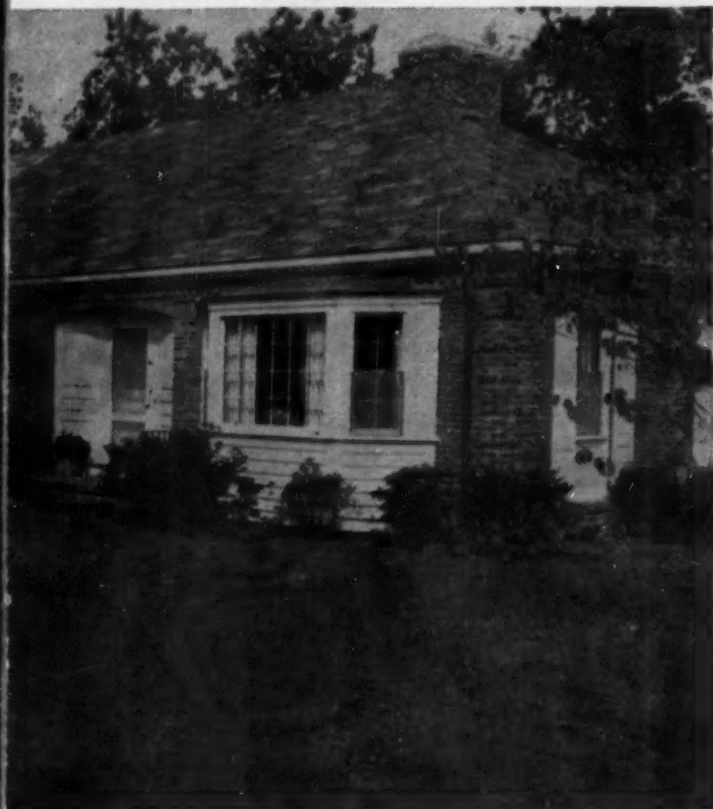
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ON GRAIN—A half-realized potential. On the average, even corn receives little more than half the plant food it could profitably use. Small grain, sorghums, soybeans, likewise. More and more farm land is moving into the hands of larger-scale farm operations. They can be sold on higher-level fertilization. Significance? A huge plant food potential, right in the very area already serviced by existing mixing plant and dealer organizations. Potash Institute agronomists coast to coast are helping build this concept of optimum fertilization.

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RELATIONSHIP

(Continued from page 9)

ation, fertilizers, seeds and so on—all of which is just fine for him—if he really understands them and realizes he is a small operator."

Mr. Hyatt is trying to get these farmers to come in and talk things over. He and his associates are trying to guide them along, to keep them from making financial mistakes before it is too late. And by doing so, the company is protecting the financial affairs of the company, too, because most of these farmers want credit.

In fact, it was for this purpose the Farm Store, Inc. was established in 1947: to help the farmers of the community. There was no place in Jonesville for them to get machinery repaired, for example, and if a farmer needed really good service he had to go to another town for it.

Stock was offered to the farmers. They were approached on the idea of setting up a company that would serve them. The stock was offered at \$50 a share.

"We found the going pretty rough at selling the farmers on the idea. We had any number say they would buy one share 'just to help you out.' We told them that we didn't need or want their money on that basis. We told them that we were trying to form an organization that would help them and possibly pay dividends but more important give them the kind of service they wanted and needed without having to go to another town.

"I guess 50 of them came in; not enough for us to go ahead with our plans. So the business people in town finished the organization," Mr. Hyatt said.

"At first, we started out as a seed and fertilizer company and we grad-

ually expanded, adding other lines until we now cover everything the farmer needs from seed and fertilizer to equipment, furniture, plumbing and electrical work," he added.

The little farmer is unable to keep up with market conditions like the large farmer. The company supplies such information regularly with letters and personal contacts. They are advised as to the best times to sell and matters like that.

With conditions as they are today, with installment buying soaring to a new high, and the average small farmer a poor business man, Mr. Hyatt says, the farm supply man can be the best friend this fellow has "if he will just listen."

Operating on the theory that a "bad account" is the worst enemy a store can have, Mr. Hyatt is encouraging these small farmers to come in and talk things over just as they would go to a banker. It is here that the store manager is in a position to advise and to see if the small operator is on sound ground.

The store's task is to "talk most of them out of spending too much money. We're having to double-check everyone's credit rating," Mr. Hyatt says.

"A fellow came in here not too long ago. Wanted to buy some mechanical equipment. I explained to him why it wouldn't be practical on his place. I explained the interest on the cost of the equipment would more than offset the cost of the labor he would need without the equipment, to say nothing of the principal. He listened and thanked me. Next thing I knew I saw him passing through town with the equipment he had bought some other place. He'll be in trouble before the year is out," Mr. Hyatt explained.

This is the time for the store operator to check everyone on his books and keep the credit rating up-to-date, especially on the small farmer. Checking credit ratings is getting to be a more difficult thing, too. There are so many places for him to buy because the automobile has enabled him to trade over a wider area.

"We are making every effort to know everything we possibly can about the people we do credit business with. We want to know whether he has a job, how much he is making, what he owes, how much he is apt to make on his farm, how much he owes us and how much we think he can pay out in a year's time. In other words, we are living, as much as possible, with our customers," he explained.

He works with the banks in the area. The furniture stores pass information along. A good source of a man's credit rating is the grocery store where he may have an account.

"Today you simply must know your customers. Now you take a woman who has just left the store. She and her husband had a fine rating with us until just recently . . . and they still have, with reservations. They owned a small place out from town and they sold it and moved to another state. Now they are back. They've rented a place close by and are farming. What do you do in a case like this? They've always paid. When I heard they had left town I checked our books immediately. They had paid us up. Now, the important thing is that they are renting and it is going to be mighty hard for them to come out financially. They're entitled to some credit, but we are going to have to put some limit on it—because I don't think they can make it," he explained.

"You have to make it a point to know something about everyone in the district you're apt to do business with and that is what I mean when I say that today, in my opinion, the dealer must establish a closer rela-

tionship with the small farmer than ever before—for his own good as well as the farmer," he said.

Not only should the dealer work with the small farmer financially to keep from getting in too deep, but he should work even more closely than ever to see that he makes a profit from his farming.

Not only does Mr. Hyatt depend on personal contact to accomplish these ends, but he has recently installed modern mailing facilities in order to keep the line of communication intact. A duplicating machine has been added, plus a machine for making address labels. Another machine which automatically addresses envelopes by the thousands has been purchased.

The one idea is to keep the small farmer informed as to what is going on.

Mr. Hyatt says that he reads the agricultural business papers religiously, seeking out information the small farmer needs.

A stack of these general information magazines and papers is kept in the front of the store for the farmers to read if they like.

The letters to the small farmers often tell them the best time for selling, based on information Mr. Hyatt has obtained through business channels. One such letter started off this way:

"As we now come to the harvest time of year, we trust that you have, this year been blessed by a wonderful season and harvest. By all signs, figures and statistics it appears that we may expect excellent prices on finer grades of tobacco and good prices on the average grades."

The letter continues by touching on hog and egg prices.

Then the letter goes into a sales theme on whatever items Mr. Hyatt wishes to promote at the time.

The mailing list is sorted alphabetically according to classification of names. Non-farmers are kept separately. Tobacco growers are filed that way. This cuts down on mailing costs.

To work even closer with the small farmers, as well as the large, it has

been necessary to develop "specialists" in the store.

Since the company handles so many different lines, it is impossible for one man to know everything about all lines. One man specializes in feed, fertilizer and insecticides. Another man has charge of the portable feed mill. It is his job to see that it functions perfectly—and to know all he possibly can about his customers.

These "specialists" regularly attend conventions and training courses on their respective lines. When they return to the store they are asked to pass information along to others.

However, these "specialists" do not devote their full time to their respective lines. They "float" from one department to the other.

If someone comes into the store with a problem one of the sales force cannot handle, the customer is then referred to the specialist. Each specialist is required to ascertain and learn everything he possibly can about each customer.

"We're trying to give the farmer every bit of service he might expect. We're working with him to help him keep his head above the water financially. The small farmer needs this assistance today as never before because his costs are rising just the same as the cost of doing business in a store is rising. When we limit his credit we figure we are doing him a big favor and at the same time helping us to remain solvent," Mr. Hyatt said.

Most large purchases are now handled through notes. These are turned over to the bank with the store's endorsement. If the bank doesn't want the paper, then it is up to the management to decide whether it wants it. In most cases the answer is no.

"Spend as much of your time as possible learning about the people you are doing business with today. Visit with him, get him to tell you his plans, advise him. You're a business man and very often he is not. Don't let him get too deeply in debt. Help him make money. He needs you today, as never before," Mr. Hyatt advises.



At your service . . .

Amos Standish, Central and South-eastern states representative for Farm Store Merchandising and Croplife, has experience as a farm equipment dealer and as a representative of a national lumber dealer publication.

When you want to know the ins and outs of selling to farm supply dealers or to the agricultural chemical people, call Amos at Harrison 7-0515 or write to 2832 Board of Trade Bldg., Chicago 4.

THE MILLER PUBLISHING CO.
Agriculture—Journalism—Education—4472

FARM SERVICE DATA

EXTENSION SERVICE REPORTS

Minimum tillage can help cut soil losses from continuous corn by as much as 40%, reports Dr. R. L. Cook, head of Michigan State University's soil science department.

Dr. Cook says these figures are based on research by the Agricultural Research Service, Soil Conservation Service, and the state experiment station.

"Soil loss is closely related to the amount of water run-off," he points out in a statement made public by the Midwest division of the National Plant Food Institute. "If we cut down on water loss, we not only save moisture for crops, but we save soil that would otherwise be lost through run-off."

"Minimum tillage leaves the soil loose and open, so raindrops penetrate as soon as they hit. Thus there is little runoff and therefore little soil loss."

Dr. Cook describes minimum tillage as "the least amount of tillage that will result in quick germination and a good stand."

"With old-fashioned tillage methods our soil is worked until it is smooth and fine," he says. "This

means many times over the field. With tractors and other implements, these multiple trips around the field pack the soil so much that when water falls on it, much of it runs off. That is particularly true if the field is sloping."

Besides saving water and soil, minimum tillage can save farmers from \$3 to \$6 in land preparation costs, Dr. Cook says. Another advantage is that it helps cut the hazard from weed competition.

"Where minimum tillage has been used on well fertilized soils, yields are just as high or higher than where more tillage was used," Dr. Cook reports.

★

Profit making potentials for thousands of farmers lie in adding fertilizer to their soils this fall, reports Ed Williamson, soils specialist for the South Dakota State College, Agricultural Extension Service.

Mr. Williamson points out that there is a "wide area for the development of fall fertilization on a number of different crops."

Among these he lists:

1. Corn. On corn land plowed down

in the fall, applications of phosphate fertilizer have increased yields just as much as have spring-applied fertilizers disked in on fall-plowed land. In most cases nitrogen has boosted yields, also, but more care is needed in its use.

Mr. Williamson says fall-added phosphate has given significantly better yield results in some cases, than phosphate applied in the spring. Deeper placement was probably the main reason the plowed-down phosphate was more effective, he indicates.

Nitrogen for corn can be applied in the fall on medium to heavy soils, if the nitrogen is in ammonium or urea form, according to Mr. Williamson. Best results are obtained after the soil temperature has cooled down to about 50°.

2. Legumes. Where the need for nutrients exists, fall fertilization can be profitable for alfalfa and other legumes. The best way to determine the need is to have the soil tested to see if it indicates a low level of phosphate. An early fall top-dressing of phosphate fertilizer can often improve the growth of weak stands and help them resist winter killing.

3. New pasture seedings. Top-dressing with phosphate fertilizer will spur fall growth and give higher yields. Meadows should be fertilized in the fall if they did not have plant food applications at seeding time.

★

If proper techniques are followed, anhydrous ammonia can be safely applied with a moldboard plow applicator, reports the Illinois Agricultural Experiment Station. During the past year, the department of agricultural engineering has determined that losses of volatile ammonia will be negligible provided the following conditions are met:

1. Soil must be in normal plowable condition. Losses increase if the soil is extremely wet or extremely dry.

2. The release hose must be attached so that ammonia is placed deep enough and far enough from furrow walls. Ammonia losses were measured after applications were made with the release hose in varying positions. Results showed that ammonia should be placed 6 in. deep or more to avoid excessive losses. Hoses should be attached to the plow so that they are trailed under the furrow slice at least 4 in. from the furrow wall. They should also be long enough to release the ammonia back of the zone of soil turbulence created by the moldboard inversion.

3. Soil should be completely inverted by the moldboard. An even plowing operation will help to seal the ammonia in the soil and to prevent excessive losses. A plowed soil which has well-defined cleavage between the furrow slices gives the ammonia a direct escape route to the atmosphere.

★

Five advantages from liming acid soils were listed by the Midwest division of the National Plant Food Institute, in reviewing a statement by E. A. Cleavinger, Kansas State College extension soils professor:

1. Lime on extremely acid soils helps make more effective other good management practices such as fertilizer use, improved crop varieties and proper tillage.

2. Lime increases bacteria activity in the soil and thus promotes the decay of organic matter and the release of plant nutrients, particularly nitrogen.

3. It increases the availability of mineral plant foods in the soil, especially phosphate; and it increases the efficiency of applied fertilizer to such soils.

4. Lime helps improve soil structure. This, in turn, increases the ease of tillage, the intake of water and the temperature of the soil.

5. Lime furnishes calcium and magnesium to growing plants. Both of these nutrients are important among

the so-called minor or trace elements.

Kansas research indicates that lime on acid soils boosted corn yields an average of 10 bu. per acre, oats yields 11 bu., wheat 6 bu. and alfalfa 1.13 tons per acre, over a 30 year period.

"In Southeast Kansas, on the Columbus experimental field, lime alone has accounted for more than 50% of the alfalfa production; better than 10% of the soybean and

small grain production; and approximately 5% of the corn production," says Mr. Cleavinger.

"All things considered," he says, "lime on extremely acid soils probably exerts the greatest single influence on increasing crop yields."

★

Robert E. Dennis, agronomist for the University of Arizona Agricultural Extension Service, has reported that safflower is showing real prom-

ise as a new crop for Southern Arizona.

Last year, a Gila variety was released. It has proven to have a good yield and is disease resistant, he stated.

The U. of A. and the crops research division of the U.S. Department of Agriculture initiated an intensive program eight years ago to develop a safflower variety for the irrigated acres of Arizona.



By AL P. NELSON

The new over-middle-age assistant bookkeeper in the office of Producto Farm Chemical Co. approached the office manager after he had returned from lunch with the president of the company.

The president had, after dessert, informed the office manager that in this competitive age, it was necessary, in the face of rising costs, to get more work out of the 12 person office department, as well as from the factory, and that he, the office manager, should tend to this task in his department, or he might find himself on the outside looking in.

After all, the president pointed out, just as there was competition among business men today for volume, so there was also competition among departmental executives for good paying jobs, such as the office manager now had on what might be termed a "floating security" basis. Did Mr. Barbour understand what he meant?

Mr. Barbour did. "All right," he told himself as he walked back to his desk. "The boss is mad at his competitors, so he takes it out on me. I'm mad, too, now and I'll take it out on somebody in my department and make him burn."

"Mr. Barbour," said the new bookkeeper, her gray hair done high on her head. "I've been aging our accounts as you suggested last week. My department has discovered, sir, that there is a farm supplies store at Strawberry Point that has been taking discounts on seven different months of the year. Discounts from 10 to 30 days late, mind you the full 2%, due only those who pay by the 10th of the month."

Mr. Barbour blinked. Here he had been ready to crucify one or perhaps two of his workers, and instead he found the bookkeeper a very discerning woman who, in "aging the accounts" had come up with specific results.

"Miss Perkins," he beamed suddenly, "I congratulate you on your vigilance. What is the name of that farm supplies firm that is rooking us on discounts?"

"Schoenfeld & McGillicuddy, sir," she said. "It's a partnership, owned by an Oscar Schoenfeld and a Patrick McGillicuddy."

"The name is familiar," muttered the office manager. "I recall we have had some trouble with this firm in the past. We wrote letters to the salesman selling the account. But I see the bad pay habit persists. We shall look into this matter immediately."

So the office manager corralled the sales manager, a chunky, red cheeked, grey suited bundle of energy who had a ready laugh and a handshake like that of Superman.

Mr. Balfour said: "Bill, we've got an account in Strawberry Point, a Schoenfeld & McGillicuddy. The stinkers have been taking a 2% cash discount as late as 25 days, seven

times last year and getting by with it. We've changed credit men twice, you know. Mr. Dunstan didn't like them. That's why these discount variances occurred."

"Really?"

"Yes, I recall we said something to your department when Mr. McCall was the head of it. But he left in a hurry, too. Can't you do something about this account? In these days of intense competition and rising costs we must conserve every dollar we can to meet the challenge of the future."

Bill Harrigan coughed. "Certainly I will do something. We will just check back on that Schoenfeld & McGillicuddy. Who do they think they are anyway, doing something nobody else is allowed to do, and taking advantage of us like that? Ed Sanderson is the salesman out there. He'll be in Friday. I'll talk to him."

Mr. Barbour went back to his department feeling pleased. He was on the ball, just the way Mr. Dunstan wanted him to be. And that grey-haired Miss Perkins who had been alert enough to dig up this pay discrepancy in a heavy office schedule after only two weeks in her job, well, he must see that she was rewarded. She certainly was doing her part to uphold the vigilance and efficiency of his department.

Ruddy-cheeked Bill Harrigan called in Ed Sanderson that Friday afternoon when the tall, alert territory salesman got in from his weekly trip.

"We cannot," Barbour said sternly, "uphold the reputation of Producto products among our dealerships, if this Schoenfeld & McGillicuddy outfit is allowed to persistently take 10th of the month discounts whenever they please. What's the pitch on them, Ed?"

Ed Sanderson flushed a little. "First let me say that I got more orders for Producto products this week than in any other week since I've been selling for the firm. And Schoenfeld & McGillicuddy placed the largest order. Let me try to set you straight on something, Bill."

"I'm listening."

"Well, this Schoenfeld and McGillicuddy outfit is a queer setup. Pat, the Irishman, is a seller and a promoter, and Oscar, the German, is a pincher and a saver. His specialty is discounts."

"Yes, but—"

Ed Sanderson held up his hand. "Wait, Bill. When I go in and try to sell Pat something, Oscar objects like fury until his bile piles up and hurts him, so he has to take a pill. But Pat holds on and finally takes on the new Producto items if he thinks he can sell them. And when it comes time to pay our bills, Oscar won't borrow money from the bank, but he still wants the discounts. So he pays when he gets the money in from customers, then he takes the 2% discount and is happy."

"But why should he be happy at our expense?"

Ed Sanderson chuckled. "Bill, these guys sell more of our products than any other dealership in my territory—by far. This guy, Pat, when he is sold on a product, he'll go all out on promotion and personal selling. He's a whiz. On the basis of relating what he has done with our new products, I've sold lots of other dealers on the lines. That's why I lead all other Midwest salesmen in selling Producto No. 7, 18 and 21. Those guys—I really mean Pat—are my biggest business asset out there. Discounts? Well, if I had my way I'd let them take discounts anytime they want."

Bill Harrigan's face was flushed. "I see what you mean. Why doesn't somebody tell me these things sooner? Here I sit every day trying to analyze sales totals and I never get the specifics. I'm going to talk to Dunstan about it right now."

Harrigan did talk to Dunstan. The result was that Dunstan called in Mr. Barbour again. Dunstan cleared his throat and told Mr. Barbour rather severely that what he meant by increasing office efficiency was regulating that department's work, so that perhaps some employees could be laid off, thus decreasing a big payroll. He did not mean, he said, that information should be dug up about good customers, with the intent of holding them up to censure and ridicule. Especially not so in this day of intense competition when good customers were so hard to find.

Would Mr. Barbour in the future please adhere to the matter of running his department instead of trying to run down good and loyal customers?

With his ears burning, Mr. Barbour went back to his desk. Had he heard right? Yes, Mr. Dunstan had upbraided him about that Strawberry Point firm taking discounts long after the deadline date. Who had told him about that problem in the first place, and thus brought him under Mr. Dunstan's ire? Oh, yes, that snoopy Miss Perkins.

So he marched over to Miss Perkins' desk which was in a far corner of the office. Hereafter, Mr. Barbour said testily, would she please confine her energies to doing bookkeeping, which was what she was hired for anyway, and not to go snooping through accounts and trying to draw conclusions and recommendations. These latter functions, Miss Perkins should know once and for always, were the responsibility of executives like Mr. Dunstan and himself. Then Mr. Barbour coughed importantly and withdrew, his thin face rigid with censure.

"Well, for goodness sake!" Miss Perkins gasped to Miss Brodie who sat at the next desk. "I've never heard the likes of this. At his suggestion, I try to age accounts, and then I get bawled out. What kind of company is this? You watch me ride herd on this chair from now on—real easy—like a lot of others in this place. Efficiency—pooh!"

WEED OF THE WEEK

Mr. Dealer—Cut out this page for your bulletin board



Broad-Leaved Plantain

(*Plantago rugelii*)

How to Identify

This plant, appearing in turf and areas other than cultivated land, is a perennial, reproducing by seed. It is found in yards, pastures, lawns, and waste places. Its leaves grow close to the ground and the flowering stalk may extend upright from 3 to 6 inches. Leaves are oval-shaped, measuring from 1 to 8 inches in length, and have smooth margins. Seeds are shiny, light to dark brown in color, irregular in shape and have a scar on one side. Each plant is capable of producing a large number of seeds. In addition to being called "Broad-Leaved Plantain," the weed is also known as Rugel's plantain, Major plantain, dooryard plantain, English plantain and common plantain.

Characteristics of Plantain

As noted earlier, plantain is a perennial, reproducing only from seeds. The seeds

are contained in a nearly cylindrical seedpod which is about 3/16" long, splitting across the lower half and containing numerous seeds. This arrangement permits the dropping of seeds to the ground, where they germinate and start a new generation of plantain. The plant flowers June to September and seeds July to October.

Damage Done by Plantain

When it appears in a lawn, the plant tends to crowd out grass by spreading its leaves on the ground. It is difficult to keep under control, particularly since ordinary mowing fails to kill it. Some sources recommend digging the plants with some type of knife-like instrument if the infestation is light. However, the application of 2,4-D and other selective herbicides has been effective in controlling the plantain.

COLLECTIONS

(Continued from page 9)

and rarely do they pay until they get a bill.

● **Check Up on Yourself.** If you are handling your credit granting function efficiently, the great majority of your customers (from 55 percent up, depending upon the line of business) will pay in full upon receipt of your statement. It is with regard to the rest that you have the problem of improving the efficiency of your collecting function. Perhaps you should check the three important factors that are the basis for a possible improvement: your collection policy; your collection system; and your collection procedure and methods.

Collection Policy

Start off by examining your collection policy for possible causes of poor collections. Frequently the lack of a clear-cut collection policy is at the bottom of a firm's collecting inefficiency.

● **Rules for Collecting.** Your collection policy should set up specific rules on such important matters as the following: (1) when accounts are to be payable; (2) how soon after the due date the first reminder shall be sent out; (3) how soon after the due date the credit privileges on a past-due account shall be suspended until the account is brought to terms; (4) how many steps there shall be in the standard follow-up and how much time shall elapse between the several steps; (5) which of the available tools and methods shall be used in the various stages of the follow-up; and (6) when past-due accounts shall be turned over to a collection agency or an attorney.

● **Be Firm—Be Flexible.** The adoption of a definite collection policy does not imply the establishment of absolutely rigid provisions from which no exceptions can be made in cases where there are extenuating circumstances. It does mean that clear-cut principles are set up as basic guides in everyday operations. Any deviation from these principles must be justified by sound considerations applicable to the specific case. After all, the secret of improving collections from credit sales is to be found in the achievement of clock-like regularity in the administration of the collection function.

Collection Systems

You may improve your collections by improving your collection system: the setup of records, filing devices, forms, and office machines and equipment which you utilize in applying various collection methods according to a definite collection procedure. Collection systems vary in detail from firm to firm, but there are certain fundamental requisites to be met by any system if the best possible collection results are to be achieved.

● **These requisites are:** (1) It (the system) should provide an accurate record of each step in the collection process until final disposition is made in the case of each account; (2) it should bring accounts to notice automatically at the proper time; (3) it should avoid unnecessary duplication of records and effort; (4) it should provide for classifying or segregating the accounts into three categories: current, past due, and suspense or attorney (customer's credit suspended or account turned over to an attorney for collection); (5) it should be arranged so that cash received is posted daily to the collection records before it goes to the general bookkeepers in order that these records will be kept up to date daily; and (6) it should have provisions for safeguarding the records from loss and destruction.

● **Collecting Mechanism.** To be most effective, your collection system or mechanism must be organized so that the follow-up on each customer with past-due accounts will begin promptly and that succeeding efforts will be

regularly directed to the account. Unless your system functions as automatically as possible, customers whose accounts have become past-due will not be promptly reminded, and those who have been reminded will not be regularly contacted again and again until results are secured. Probably the most important requisite for successful collection activity is the regularity and persistence with which past-due accounts are followed up. Hence the importance of checking every element in your collection system to make its operation truly automatic and efficient.

Collection Procedure and Methods

Your collection procedure should be deliberately planned so that it will move, in a regular and orderly way, through a series of steps, the collection effort gradually becoming more and more insistent until final decisive action is taken. The procedure should be organized into the following four logical steps: (1) reminding the customer; (2) requesting response; (3) insisting on payment; and (4) final action.

1. **Reminding the customer.** All those customers who do not respond to your invoice or statement within the time limit set by you must be reminded that their accounts have become past due.

Tone: The tone of this first reminder should be mild because the only reasonable assumption to make at this point is that the customer has simply overlooked the matter. He may have been negligent, or he may have been confronted by some emergency which made immediate response impossible. Thus far, then, his failure to pay is no indication of either unwillingness or inability to pay his bills.

Methods: Good methods for giving the past-due customer a reminder are: printed or mimeographed form notices in the shape of a card or a slip of paper about three by five inches in size; duplicate or short-form statements with or without a reminder message in the form of a sticker, insert, or written, typed, or rubber-stamped appeals; telephone calls. In most lines of business, collection letters and personal calls are best reserved for later steps in a firm's collection procedure.

Content: As for the content of this first reminder, at least it must bring to the customer's attention the amount owing, the fact that it is past due and no remittance has been received, and a request for payment. It should also restate your credit terms, and thus contribute toward educating your customer to pay promptly according to terms to which he agreed.

Timing: How soon after the due date the first reminder shall be sent out is, as indicated previously, a matter for you to decide in establishing your collection policy. Timing varies greatly in different lines. For example, installment sellers and installment lenders usually send the first reminder notice within a few days after an account becomes past due, whereas some manufacturers and wholesalers and many retailers may wait a month before reminding the customer.

Whether you wish to improve collections by reminding past-due accounts promptly is a matter that is up to you. But normally you need have no fear of incurring ill will by promptness in reminding, provided the content of the first reminder notice is not such as to give offense. Its impersonal form should be such as to indicate to the customer that he is not being singled out for discriminatory action but is receiving the same treatment accorded all others in similar circumstances.

2. **Requesting response.** Those customers who do not react to the simple reminder you give them in Step 1 should be automatically subjected to

the second step of collection follow-up after a predetermined number of days. The message used here not only reminds the customer of his debt but also asks for a response.

Tone: The tone you use is still mild and courteous. While it cannot be assumed that the customer is simply overlooking the invoice or statement (since it has already been brought to his attention by the first reminder), the only logical attitude to take is that there is some valid reason why payment has not been made. And there are plenty of possible good reasons: There may have been a mistake in the billing; the customer may have been dissatisfied with the goods or the treatment received, or he may be temporarily financially embarrassed.

Methods: The purpose in this step is "to get a rise out of the customer"—to find out why he is slow in paying so that you can figure out what can be done to remedy the difficulty. The methods used are generally similar to those employed in making up the first reminder. Impersonal notices on paper or three-by-five-inch cards are effective. So are telephone calls and short form letters.

Content: The content of the message in this second step is similar to that in the first step of the follow-up, but in addition you ask the customer to advise you of his reason for non-payment.

Timing: How much time should be permitted to elapse between the first and second steps of the follow-up depends on the type of business involved. For example, not more than five days, or at most a week, should be allowed between reminding and requesting response in case you are engaged in installment selling or installment lending. In the case of manufacturers, wholesalers, and retailers generally there is rarely any justification for waiting more than 15 days before requesting a response from a customer who has been sent a reminder.

3. **Insisting on payment.** Those customers who have not responded to the foregoing follow-up require a third step in which a still different procedure is applied. It has been some time now since you notified the customer by sending him an invoice or statement; later you reminded him of his failure to pay as agreed; then you reminded him again with a request for some kind of a response; you have not been able to get in touch with him, and he has not communicated with you.

Tone: Thus, as you prepare to take the third step in the collection follow-up, it is reasonable for you to begin to suspect that the customer you are now dealing with may prove to be unwilling, and perhaps does not intend to pay his bill at all.

It may seem strange, but many honest customers who really intend to pay their bills do not respond promptly and frankly to duns from a creditor; for some reason they dislike explaining just what their difficulty is, and how they would like to take care of their obligations. They act precisely as people act who intend not to pay at all. Because you cannot be sure into which category they fall, the only reasonable attitude for you to assume in applying the third step of the collection follow-up is that the customers who make it necessary are very likely unwilling debtors seeking to avoid their obligations. Hence you are now justified in bearing down and applying increasing pressure.

Methods: In each of the foregoing steps only one effort was made: a simple reminder, and one reminder requesting response. But in this third step a number of efforts, increasing in severity, are often called for. Here a variety of methods may be employed: collection letters utilizing appeals to fairness, pride, self-interest, and fear; humorous or stunt letters; telephone calls; telegrams; registered letters; personal calls; a series of letters sent by a collection agency or an

attorney to whom you have turned over the past-due account for collection.

Content: The content of the third step collection messages may include various pressures: temporary suspension of credit privileges on the past-due account; threats to report the account to the credit bureau, the firm's legal department, firm's outside collector, a collection agency or an attorney; and, in the case of installment sales, threats to repossess the merchandise or to sue.

Timing: The time allowed to elapse between the request for response and the first message insisting on payment should not be more than a week in such lines as installment selling and installment lending. In such businesses the rule is that a customer who has missed an installment payment must be reached before the date of his next payment arrives. Thus an installment buyer who has missed a monthly payment will receive three notices before his next payment falls due; a reminder, a request for response, and a threat to repossess the merchandise unless the past-due payment is made or satisfactory arrangements are worked out.

In other lines more time is allowed, but it is difficult to justify permitting more than 15 days to elapse between an unanswered request for response and the beginning of the stage where you insist on payment. This stage may then extend over several weeks or months, depending upon the circumstances in each case, while succeeding efforts, increasing in severity, are made to collect the account.

4. **Final action.** In analyzing the customers who have failed to pay or make satisfactory arrangements to liquidate their indebtedness to you after the preceding three steps in collection follow-up, you will find that these customers fall into two main classes.

The first class consists of those who are able to pay but must be forced to do so. Some of these will be found to be "skips," and they should be traced if the expense is justified; and suits should be brought if the amount they owe merits the expense. Even if you are engaged in installment selling, you may prefer to sue instead of repossessing in cases where you and your attorney are of the opinion that the account will be collectible under judgment.

The second class is composed of those who are willing but who cannot pay in full, or who cannot pay within a reasonable time. You may be able to induce these customers to re-evaluate their financial position and find some way to pay their debts within a reasonable period.

● **What Can You Do?** In the case of a customer who is so deeply involved that he apparently will not be able to pay in full, even over a long period, perhaps he can be induced to pool his obligations so that you and his other creditors may salvage as much as possible out of the situation. In case you are selling durables on the installment plan and you find that the customer cannot pay in full or would take an unduly long time to do so, final action may be taken by repossessing the merchandise.

● **What More Can You Do?** If you attack your collection problems along the various lines that have been indicated, you will find that there will only be a very few accounts that you are unable to collect yourself. But to achieve the best recoveries on such accounts, you should follow a definite policy of turning them over to a collection agency or an attorney before they are too old. No general rule can be laid down for all cases in all lines of business, but certainly if you have been wrestling with a past-due account for six months and have got nowhere, it would seem undesirable to delay longer in turning it over to an agency or an attorney specializing in collections.

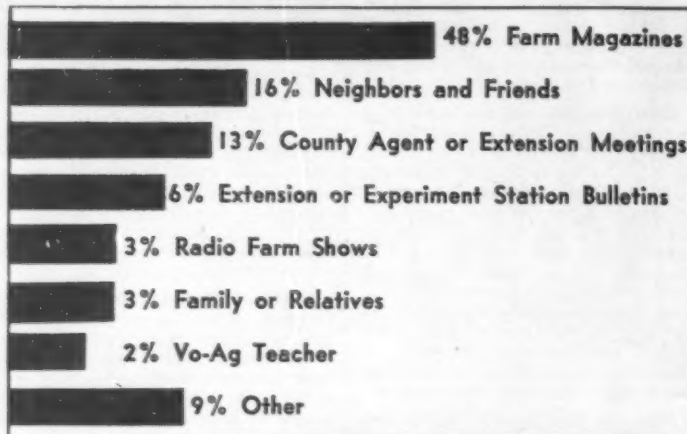


FIGURE 1. Where Ohio Farmers Secured Information About Farm Practices

Farmer-Businessman Communication

"Because of the growing interdependence of farmers and their suppliers, improved communication has become more crucial."

By Dr. Everett M. Rogers
Ohio State University

The very nature of modern farming is dynamic and changing. The stereotype of the independent farmer-pioneer is now obsolete. He has been replaced by a farmer in a business suit whose success is dependent on consumer preferences, government regulations, the costs of farm supplies and the whims of foreign export. American agriculture is moving from a past era of rugged independence into a modern era of agribusiness, where farmers and agricultural industries are interdependent.

In the face of rapidly changing agriculture and because of this growing interdependence, improved farmer-businessman communication be-

comes more crucial. The purpose of this report is to help farm dealers improve their communications with their farm customers.

Why is it important to improve farmer-dealer communications?

One type of communication concerns new farm practices such as weed sprays, feed additives, fertilizers, livestock medicines and new machinery. One might think these new ideas would be adopted quickly by farmers. On the contrary, a classic study by two Iowa rural sociologists found that hybrid seed corn did not reach complete adoption until 12 years after it was widely available. The average farmer waited about seven years after first hearing about

hybrid seed before he planted all of his corn acreage in hybrid.

Another indication of the importance of my topic, I think, is the widespread circulation of a bulletin on this topic, "How Farm People Accept New Ideas." In the three years that this publication has been available, over 80,000 copies have been sold, making it one of the best read pieces of sociological literature of all time. Many agricultural companies purchased a copy for every one of their employees.

Yet another indication of the importance of my report lies in the tremendous amount of research that has been completed. About 126 different research studies have been published on how farmers adopt new products. And I will attempt to summarize these many thousands of dollars worth of research.

Five Questions

I will attempt to answer five main questions:

(1) Where do farmers secure information about new products?

(2) How do farmers get convinced to adopt new products?

(3) How may the time gap between awareness and adoption be shortened?

(4) Do farm dealers reach the key farmers who, in turn, are respected by other farmers?

(5) Why don't farmers trust information from commercial concerns?

I will attempt to draw some answers to these questions from my recent research here in Ohio (some of which has not been reported prior to now)—plus the studies of other rural sociologists in neighboring states.

Where do farmers secure information about new products?

Farm magazines are the farmers' most important source of information about new products. Dealers, salesmen and company publications are of relatively little importance in making farmers aware of new practices. Findings from a recent study of Ohio farmers as to where they secure new farm information are shown in Figure 1. Generally similar findings also have been reported by studies in other states.

While dealers may not be so important as a source of information about new farm ideas in general, they may be of greater significance in the case of certain products. For example, 53% of the 573 Iowa farmers sampled in 1951 said dealers and salesmen were their chief source of information on the use and care of farm machinery. An additional 18% relied chiefly on dealer bulletins, while only 21% named farm magazines in this study.

How do farmers get convinced to adopt new products?

It already has been pointed out that most farmers are aware of new products for several years before they adopt. What convinces farmers to try out new ideas?

Figure 2 shows that while mass media such as farm magazines are most important in creating awareness of new ideas, it is personal influence from friends and neighbors that convinces farmers to adopt.

As one farmer told me last year in a research interview, "I usually hear about new farm ideas several years before I actually adopt them on my farm."

"I'm convinced that the new practices are good, but I guess you'd call me conservative. I like to see the new practice on a neighbor's farm before I adopt it."

I'll tell more about the importance of neighbors in convincing farmers to use new ideas later when we discuss why farmers don't trust commercial sources of information.

How may the time gap between the awareness and adoption be shortened?

EDITOR'S NOTE

The agricultural chemical trade has read results of other studies on factors influencing farmers to purchase various goods and services, but the accompanying article by Dr. Everett M. Rogers covers some additional points of interest to the industry. The paper was presented by Dr. Rogers at the Agricultural Marketing Conference at Ohio State University recently. The author is an assistant professor of rural sociology with the department of economics and rural sociology at Ohio State University.

In a recent study, we found that some Ohio farmers adopted 2,4-D weed spray in the same year that they first heard of the practice. Other Ohio farmers waited 10 years after hearing about 2,4-D before they adopted. Why do some farmers have a longer adoption period than others?

Lack of information is seldom the reason that new practices are not adopted. In fact, most studies indicate that all farmers know about a new idea before more than a handful have adopted. This suggests that simply adding "more information" about a new practice seldom will speed up its adoption. Few farmers feel they are actually "rationed" on technical information.

The important factors retarding the rapid adoption of new practices often are farmers' attitudes, values, past experiences and group influences. This is why the topic under consideration is a sociological research problem.

Past research studies generally have indicated that once a farmer tries out a new idea, complete adoption soon will follow. The farm dealer often can play a vital role at this "trial stage" by helping a farmer use a new product on an experimental basis and by assisting him in the interpretation of test results. Adoption of a new practice usually will follow the trial step rather directly.

Not only do farmers vary in the number of years they require to adopt a new product, but the characteristics of the practice itself also affect its rate of adoption.

Following is a list of factors which affect the rate of adoption of a new farm product.

(1) **Cost**—New practices which are high in cost tend to be adopted more slowly. Corn picker-shellers will be accepted more slowly than new weed sprays costing a few dollars.

(2) **Complexity**—New ideas that are relatively simple to understand generally will be adopted more quickly than complex farm ideas.

(3) **Visibility**—New products vary in the extent to which their results are visible or "showy." For example, sprinkler irrigation is a highly visible practice. In contrast, chemical rat poisons kill the rodents in their burrows and the results are not so easily observed. A new product generally will be adopted more quickly if it is visible.

(4) **Past experiences**—New products also are adopted more readily when a farmer has previous experience with a related idea. The use of 2,4-D weed spray was hastened because farmers in an Iowa study already had purchased sprayers to control corn borers. Hybrid chickens and hogs have been more easily adopted because of farmers' familiarity with hybrid corn.

(5) **Divisibility**—If a new idea is divisible for trial use, it generally will be adopted more quickly. Most fertilizers, weed sprays and seed varieties may be divided for comparison of results with previous practices. However, bulk milk tanks and many new farm machines can not be divided easily for trial on a small scale.

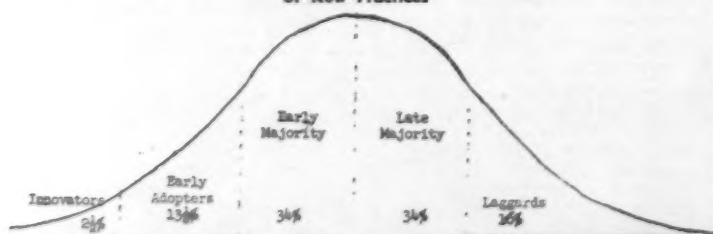
Do farm dealers reach the key

FIGURE 2. Sources of Information (Arranged in Order of Relative Importance) in the Adoption Process

Awareness (Acquaintance with the New Idea)	Information (Gathering of Additional Information and Facts)	Application (Mental Trial and Conviction)	Trial (Small Scale Experimental Use)	Adoption (Large-Scale Continued Use and Satisfaction)
1. Mass media (Farm magazines, bulletins, radio and TV farm shows)	1. Mass media	1. Neighbors and friends	1. Neighbors and friends	Almost entirely dependent on satisfaction with trial; there is little outside influence on the adoption decision
2. Salesmen and dealers	2. Government agencies	2. Government agencies	2. Salesmen and dealers	
3. Neighbors and friends	3. Neighbors and friends	3. Mass Media	3. Government agencies	
4. Government agencies (Extension, SCS, and VoAg)	4. Salesmen and dealers	4. Salesmen and dealers	4. Mass Media	

SOURCE: A composite summary of findings from 35 different research studies reported in North Central Rural Sociology Sub-Committee on Diffusion of Farm Practices, "How Farm People Accept New Ideas," Ames, Iowa, Agricultural Extension Service special report 15, 1955; and Dr. Everett M. Rogers, Social Change in Rural Society, N.Y., Appleton-Century-Crofts, 1960.

FIGURE 3. Adopter Categorization on the Basis of Time of Adoption of New Practices



The innovators are the first 2.5% to adopt new practices. The laggards are the last 16%. The exact percentage of farmers included in each category is somewhat arbitrary but has been accepted by many rural sociologists as a means to standardize their research studies.

*North Central Regional Committee on Rural Sociology, Subcommittee for the Study of Diffusion of Farm Practices, "How Farm People Accept New Ideas," Ames, Iowa, Extension Service Special Bulletin 15, 1955.

**An example in Bryce Ryan and Neal C. Gross, "The Diffusion of Hybrid Seed Corn in Two Iowa Communities," Rural Sociology, 7:15-34, 1942.

FIGURE 4. Characteristics of the Five Adopter Categories

Characteristic	Innovators	Early Adopters	Early Majority	Late Majority	Laggards
1. Time of adoption	The first 2.5 per cent to try out new farm ideas	The next 13.5 per cent to adopt new farm ideas	The next 34 per cent to adopt new farm ideas; they adopt just before the average farmer	The next 34 per cent to adopt new ideas; they adopt just after the average farmer	The last 15 per cent to adopt; they resist new farm practices until the whole community has adopted
2. Are their farming methods respected by their neighbors?	No; they influence other innovators and possible the early adopters	More respect than any other adopter category	Less respect than early adopters	Possess little respect	No respect as sources of information
3. Income	Highest; innovators have risk capital	High	Medium	Medium	Lowest
4. Size of farm	Largest	Large	Medium	Medium	Smallest
5. Age	Youngest	Young (not younger than innovators)	Slightly younger than average	Slightly older than average	Oldest
6. Education	Most education; 50% have some college	More education than average	Slightly above average	Slightly below average	Least education; eighth grade or less
7. Social contacts	Extra-community friendships and travel widely	Leadership in formal organizations within community	Contacts within community limited to neighbors and friends	No contacts outside community; may contact with neighbors and friends	Very few contacts; semi-isolated
8. Personal sources of information	Agricultural scientists and other innovators	Extension agents, SCS workers, Volk teachers	Agricultural agents, early adopters	Mainly neighbors and friends	Only neighbors and friends
9. Impersonal sources	Research bulletins and farm magazines	Farm magazines, Extension bulletins	Farm magazines, radio and TV farm shows	Fewer magazines, mostly radio and TV farm shows or radio farm shows	Very few magazines or radio farm shows
10. Values and attitudes	Scientific and venturesome	Progressive	Slightly conservative	More conservative and traditional	Folk beliefs and tradition; agricultural magic; suspicious of change agents

farmers, who, in turn, are respected by other farmers?

In order to answer this question, I must introduce a system of categorizing farmers as to their relative time of adoption of new practices. Five adopter categories are shown in Figure 3.

Innovators are the first farmers to adopt new ideas. Early adopters are next, followed by early majority, late majority and lastly by laggards. The exact percentage of farmers included in each category is somewhat arbitrary.

The characteristics of each category are shown in Figure 4. Innovators have the largest farms, the highest farm incomes, the most education and the most scientific and venturesome attitudes. Innovators often go directly to agricultural scientists for new information.

About 10% of the farmers had some type of direct personal contact with agricultural scientists in the year preceding the study. In contrast, none of the laggards and 42% of the innovators had contact with scientists. In the other categories, 14.3% of the early adopters, 17.1% of the early majority and 5.7% of the late majority had direct contact with agricultural scientists during the past year.

The wide travel of innovators is illustrated by their answers to the question, "Have you traveled outside of your county within the past year to observe some new farm practices?"

My poorly-worded question shows how little I knew about the innovators. About 80% went outside of their county. In fact, almost half had not only traveled outside of their county, but also outside of their state or the U.S. to see some new farm idea. Here are some of the replies:

"I was interested in dairy and beef nutrition in Michigan and potato-growing automation in Pennsylvania."

"... Beef and dairy enterprises in South America, wheat practices in Canada and the new beef ideas in Colorado and Nebraska."

"I visited with swine research men at the Iowa and Minnesota Agricultural Experiment Stations."

Because innovators are relatively well-educated and travel widely for scientific findings, they may find out about new ideas before their local county agent or farm dealer. Some of the respondents in my state-wide study of 99 innovators even indicated they regarded their county agent as their "technical inferior."

"Commercial companies and farm magazines seem to get here first with new ideas. The county agent hasn't too much help to me," said one.

"The county agent is of almost no help to me. I am a graduate of Ohio State University in animal science and I am more aware of current practices than the county agent is," said another innovator.

The innovators were highly specialized farmers. They only kept up-to-date in one special field such as broilers, beef or fruit. But a county agent and a farm dealer are "generalists." They are expected to know "everything about everything."

Other innovators who made a good deal of use of their county agent reported that they viewed him in a different role than did the average farmer. The innovator was more likely to regard the county agent as a technical equal, to call him by his first name and to regard his advice with least respect. I might suggest that the innovator views his farm dealer in a similar light.

Are innovators also looked to by farmers for information and advice about new farm products? In general, the answer is "no." In fact, farmers often regard the innovator's farming methods with disrespect.

Here are some responses from Ohio innovators who were asked what their neighbors thought of the new farm products they used:

"Some think we are a little cracked."

"The way I farm is not the way to win popularity contests among one's neighbors."

"Fifty per cent think I am crazy, the other 50 per cent are sure I am."

I earlier mentioned the importance of friends and neighbors in convincing farmers to adopt new products. Specifically, not all neighbors and friends are important "convincers." Some farmers are particularly influential in their neighbors' adoption decisions. These key farmers often are referred to as adoption leaders because they "lead" in the adoption of new ideas. Adoption leaders are a key target for a farm dealer's promotion efforts. Past research shows the adoption leaders are most often in the early adopter category. They use new products before their neighbors do, but not too far before.

Innovators seldom are adoption leaders. Their neighbors do not look to them for information and advice. This is diagrammed in Figure 5. Farmer No. 1 was located right in the midst of his 13 neighbors and was using 2,4-D weed spray for years before they adopted the same practice. Yet only one farmer went to this innovator for information. It is easy to see that farmer No. 2 is the key farmer for the farm dealer to cultivate.

Dealers may speed up the adoption

process in their community by working closely with the adoption leaders. Others then will follow along in a few years after these influential farmers demonstrate the new product. However, past research studies show that while word-of-mouth advertising by adoption leaders will sell their neighbors on adopting a new product, the neighbors seldom are convinced by the leaders as to the specific brand or store. This suggests that dealers may not be fully utilizing adoption leaders as well as is possible.

What should a farm dealer do about innovators? Should he work with them or forget about them? There probably is little a local dealer can do to secure the adoption of his product among innovators. And even if an innovator adopts a new product, he isn't likely to convince his neighbors of its value. The fact that innovators travel widely suggests that perhaps they could be invited to a state-level sales meeting where new products are announced. In any event, innovators are relatively small in numbers. A dealer

should concentrate his personal contacts upon the early adopters.

Why don't farmers trust information from commercial concerns?

In order to properly understand the answer to this question, one must be acquainted with the so-called "trickle-down theory."

This trickle-down process begins with agricultural scientists at the state experiment stations, U.S. Department of Agriculture and commercial concerns. Information about new products is communicated directly to change agents of various kinds: county agents, teachers, dealers and other professional agricultural workers. Few farmers have direct contact with scientists (one exception is the innovator). Most farmers depend on the change agent to recommend new products to them. The early adopters accept these new ideas first and then pass them along to other farmers.

Thus the new ideas trickle-down from one farmer to another much as water runs down a hill. The new ideas may become garbled or leached out as they pass from one farmer to another. And the information may encounter "layers of hardpan" as it soaks down through the social structure of a rural community. The laggards are not much interested in new products. They largely ignore the trickle-down process unless they happen to get splashed with a new idea by accident.

Past research studies indicate farm people place a great deal more faith, trust and credibility in the process by which new ideas flow from experiment station scientists to county agents to farmers than in the process from commercial scientist to dealers and salesmen to farmers.

Why is this so?

We asked a state-wide sample of Ohio farmers last spring, "Would you be more likely to be convinced of a new farm practice if you heard about it from a neighbor or from a salesman?" Only about 1% answered in terms of the salesman. Typical reasons for trusting neighbors rather than salesmen were:

"Salesmen would be prejudiced."
"Salesmen, heck, they try to blow everything up."

"I don't believe salesmen."

Farmers seem to place even less credibility in salesmen than they do in dealers.

For example, here is a portion of an interview with an Ohio farmer:

Interviewer: "How does a farmer

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feel toward salesmen with agricultural products?"

Farmer: "Worthless machines, shrewd schemes, they're all out to get the farmer. The worst ones are those feed and fertilizer salesmen. Sometimes I buy something just to get rid of them."

Interviewer: "How about dealers or salesmen that you know and deal with regularly?"

Farmer: "Well, that would be altogether different. If you know them, it's different. I call my implement dealer 'Jack.' I've known him for 25 years. But it's these door-to-door fellows that you've got to watch."

In another study, I found evidence that farmers placed much more faith in the research findings of U.S. Department of Agriculture and experiment station scientists than in commercial scientists.

Has some of our advertising and exorbitant product claims taught the farmer not to believe the commercial message? I have no research evidence on this score, but I would suggest an important topic for future research would be the reasons for the lack of farmer faith in credibility in commercial sources of information.

In any event, our studies show that farmers place a tremendous faith or trust in the experiment station-county agent trickle-down process. A research study currently is underway in investigating why farmers purchase a costly new machine that is not recommended by the extension service. We are finding that the county agent may be even more effective at preventing the adoption of a non-recommended product than in promoting the adoption of a recommended practice.

Our findings certainly suggest that the wise farmer dealer is one who works through his local county agent to secure the introduction of new products. He had better "join him if he can't lick him."

Other suggestions that I would make to farm dealers would include:

1. Farm store dealers must keep up to date with new products themselves, for their customers otherwise will not look to them for information and advice.

2. The time required for dealers to select and work with adoption leaders probably is time well spent.

Lastly, I see a need for research on farm dealers by rural sociologists. We have studies of how county agents learn of new farm ideas and influence farmers to adopt them. We know much less about how farm dealers operate in the trickle-down process. The only research study I know of on this topic by Beal and Bohlen at Iowa State University showed that fertilizer dealers knew only a very little more (and in some cases less) than their customers about new fertilizer practices.

INORGANIC

(Continued from page 1)

for seasonal variation and number of working days.

Synthetic anhydrous ammonia production during October, 1959, was 386,261 short tons or 27,280 more than the previous month and 59,758 more than the same month the previous year.

Ammonium nitrate production of 249,279 short tons was slightly higher than both the previous month and the same month in 1958.

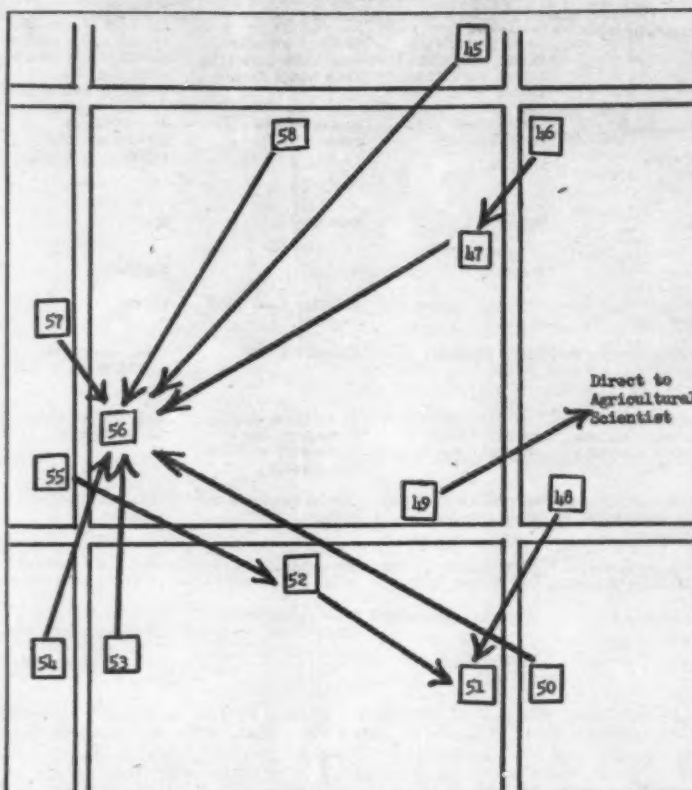
Production of ammonium sulfate during October, 1959 was 90,649 short tons or slightly less than the previous month but somewhat higher than the same month in 1958.

Nitric acid output was 64,531 short tons in October, compared with 68,248 short tons in September and 47,566 short tons the preceding year.

Production of phosphoric acid was 162,725 short tons, higher than both the comparing periods.

Sulfuric acid production was 1,445,246 short tons, which was higher than that produced during September, but less than production in October, 1958.

FIGURE 5. Where 14 Ohio Farmers Secured Information About 2,4-D Weed Spray



The arrows show where these 14 farmers in a small Ohio neighborhood secured information about 2,4-D weed spray. Farmer No. 2 is an adoption leader. Eight of his neighbors went to him for information and advice. Farmer No. 1 is an innovator. He was the first farmer to adopt the weed spray in the community. He secured information about the new product directly from an agricultural scientist.

Federal Grants of Nearly \$45,000 For California

BERKELEY, CAL.—Federal grants totaling around \$45,000 were made to the division of agricultural sciences at the University of California last month to promote various studies in the field of agricultural chemicals.

Most of this amount was given by the United States Public Health Service for at least three research projects. The sum of \$17,500 was allocated for research on the influence of microenvironments on insects; another \$9,186 goes for research on the culture of insect tissues for insect virus studies; and \$8,291 is allocated for research on the nature of infectious processes in insects.

The Office of the Surgeon General

of the U.S. Army also made a grant of \$9,335 for research on the degradation and storage of insecticides in normal and resistant insects.

\$1.3 Million Granted For College Research

WILMINGTON, DEL.—Grants totaling more than \$1,300,000 have been awarded to 143 universities and colleges in the E. I. du Pont de Nemours & Co., Inc. annual program of aid to education, the company announced.

The program is for fundamental research by universities, for strengthening the teaching of science and related subjects, and for facilities for education or research in science and engineering.

FREEZE CURE?

LUBBOCK, TEXAS—One way to prevent Coastal Bermuda from winter freezing in this area may be to increase the amount of potash. U.S. Department of Agriculture officials report that high nitrogen levels without adequate potash tend to make plants more susceptible to winter-kill.

Nitrogen is essential but potash may be needed to harden the plant. Researchers have not said definitely that potash will prevent Coastal Bermuda from freezing out here, but say it could bear investigation.

South Dakota Fertilizer Meeting Now Two Days

BROOKINGS, S.D.—For the first time the short course on fertilizer and soil management held annually at South Dakota State College will be a two-day affair. The dates are Jan. 26-27.

According to Lawrence Fine, head of the agronomy department, the second day of the conference will be of special interest to farmers and dealers. Registration and a machinery exhibit will be held in the machinery wing of the new agricultural engineering hall located on the eastern edge of the campus.

During the afternoon program, farmers and fertilizer dealers will hear information on topics such as tillage and fertilization for continuous corn, South Dakota yield potentials, and the importance of replacing fertilizer.

Specialists in agronomy from South Dakota State College, the University of Minnesota and representatives from the fertilizer industry will appear on the program.

Tuesday's program will be of particular interest to dealers. It will include the annual business meeting of the South Dakota Fertilizer Dealers Assn.

Robert J. January New Chapman Manager

MEMPHIS, TENN.—Robert J. January has been named sales manager of the agricultural chemicals division of the Chapman Chemical Co., Memphis manufacturer and distributor of agricultural and industrial chemicals and wood preservatives.

Originally of Trenton, Tenn., Mr. January was graduated with a bachelor of science degree in industrial management from Georgia Tech in 1949.

After serving the chemical field with Thompson-Hayward Chemical Co. of Memphis, he joined Chapman as a district salesman in 1951. He served in that capacity until his recent appointment.

California Ammonia Meeting Postponed

FRESNO, CAL.—A joint statement of the California Fertilizer Assn. and the Agricultural Ammonia Institute announces postponement of the California Ammonia meeting scheduled to be held Feb. 12 at the Hacienda Hotel here. Postponement is due to a conflict of dates and speakers' schedules which made it necessary to change the meeting date. Further announcements will be made later.

Air Conference Set

BATON ROUGE, LA.—Louisiana pilots who apply seed and agricultural chemicals from the air will attend the fifth annual conference of the Louisiana Agricultural Applicators Assn., Jan. 21-22 in Baton Rouge.

The conference will be held in Seaman A. Knapp Hall on the Louisiana State University campus. Also attending will be representatives of educational institutions, government agencies and industries.

Topics to be featured at the conference will include recommendations for the use of insecticides in 1960.

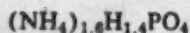


INDUSTRY-EXTENSION CONFERENCE—Michiana Chemical Co., Niles, Mich., played host recently to a group of 25 Michigan county agents and members of the soils conservation and county extension services of Michigan in a meeting sponsored by the manufacturing company. The conference was under the direction of Dr. R. L. Cook, head of the soil science department of Michigan State University, East Lansing. Better crop production and increased county soil testing for the coming spring season were subjects discussed at the meeting. Following lunch, the group toured the fertilizer manufacturing facilities of the company and discussed private and state soil testing and closer liaison between extension services and the plant food industry. In the picture, Alf H. Olmes, president and secretary of Michiana, points out plant facilities to some of the visitors.

PATENTS and TRADEMARKS

2,919,183

Fertilizer Solutions. Patent issued Dec. 29, 1959, to Ivan Christoffel, Hopewell, Va., assignor to Allied Chemical Corp. A fertilizer solution composed of ammonium phosphate having substantially the composition



and ammonium nitrate amounting to 0.65 to 1.15 times the weight of the ammonium phosphate in water amounting to 44% to 52% by weight of the solution, and having a salting out temperature not substantially above 5° C.

2,919,223

Fungicidal Compositions and Methods Employing Parachloro-Alpha-Iodotoluene. Patent issued Dec. 29, 1959, to Robert G. Baker, Huntington Beach, Cal., assignor to the Dow Chemical Co., Midland, Mich. In the practice of agricultural economy for the control of soil-dwelling fungi, the method which comprises impregnating soil with p-chloro- α -iodotoluene in amount of at least 6 parts by weight per million parts by weight of soil.

2,919,227

Synergist-Containing Polycyclic Aldehydes and Alcohols as Insect Repellents. Patent issued Dec. 29, 1959, to Lyle D. Goodhue and Kenneth E. Cantrell, Bartlesville, Okla., assignors to Phillips Petroleum Co. An insect repellent containing as an essential active ingredient a polycyclic repellent compound selected from the group

consisting of 2,3,4,5-bis(delta¹-butenylene)tetrahydrofurfuryl alcohol and 2,3,4,5-bis(delta¹-butenylene-tetrahydrofurfural together with a synergistic amount of N-octyl bicyclo [2.2.1]-5-heptene-2,3-dicarboximide, wherein the ratio of said N-octyl bicyclo [2.2.1]-5-heptene-2,3-dicarboximide to said polycyclic repellent compound is in the range of 0.5:1 to 10:1 parts by weight.

Industry Trade Marks

The following trade marks were published in the Official Gazette of the U.S. Patent Office in compliance with section 12 (a) of the Trademark Act of 1946. Notice of opposition under section 13 may be filed within 30 days of publication in the Gazette. (See Rules 20.1 to 20.5.) As provided by Section 31 of the act, a fee of \$15 must accompany each notice of opposition.

Dibrom, in capital letters, for insecticidal preparation. Filed Sept. 22, 1958, by California Spray-Chemical Corp., Richmond, Cal. First use Aug. 4, 1958.

Nellite, in capital letters, for organic phosphorus compound principally for use as an active ingredient in the manufacture of parasiticide, especially insecticidal, compositions. Filed March 13, 1959, by the Dow Chemical Co., Midland, Mich. First use April 10, 1958.

Sollet, in capital letters, for organic chlorine compound principally for use as an active ingredient in the manufacture of herbicidal compositions. Filed March 13, 1959, by the Dow Chemical Co., Midland, Mich. First use April 10, 1958.

Soybean Cyst Nematode Hearing Set in Illinois

WASHINGTON—The U.S. Department of Agriculture has announced a public hearing on a proposal to quarantine Illinois against the soybean cyst nematode and to regulate a localized infestation of the nematode in Pulaski County.

The hearing will be held in the auditorium of the Illinois Building, State Fair Grounds, Springfield, at 10 a.m. Jan. 26.

The soybean cyst nematode was discovered on a single farm near Mounds in Pulaski County during September. A hearing was held by the state of Illinois in Mound City on Oct. 8, and a quarantine on intrastate movement of host material was issued on the same date. Samples have been taken from some 1,600 farms comprising nearly 93,000 acres in 82 Illinois counties without finding additional infestations.

Infested localities in Arkansas, Kentucky, Mississippi, Missouri, North Carolina, Tennessee and Virginia already are under quarantine. Cooperative federal-state survey programs in these states have been under way since the summer of 1957.

A federal quarantine would restrict the movement from infested premises of host material likely to carry the nematode. It would affect principally the movement of soil or soil-contaminated articles like nursery stock with roots, bulbs, root crops, soybeans, small grains and ear corn. It would also affect used farm tools, implements and harvesting machinery.

The soybean cyst nematode is capable of causing destruction of a crop of soybeans. It also parasitizes annual lespedeza and common vetch.

BILL KIRK DIES

AMARILLO, TEXAS—Bill Kirk, 54, of Amarillo died in a local hospital following a heart attack. He was owner-operator of the Old Scratch Manufacturing Co., which made spreaders for insecticides.

Paper Company Breaks Sales Record in 1959

NEW YORK—West Virginia Pulp and Paper Co. in fiscal year 1959 established record sales for the seventh successive year, David L. Luke, president, told stockholders in the company's annual report.

Mr. Luke noted that net sales for the year ended Oct. 31 had advanced to \$233 million from \$208 million in 1958, an increase of 12%. This compares with sales of \$95 million 10 years ago.

While these sales generated a profit 23% higher than that of 1958, Mr. Luke noted that earnings in 1959, in common with the paper industry as a whole, did not recover fully to levels preceding the 1957-58 business recession.

Mr. Luke attributed this situation to overcapacity in various segments of the industry which resulted in product prices that fell short of fully re-

CROPLIFE, Jan. 11, 1960—21

flecting increases in costs, particularly the additional costs incurred to improve the quality of products.

West Virginia's net earnings from operations in 1959 amounted to \$11.8 million, equal to \$2.21 per share of common, as compared to \$9.6 million, or \$1.78 per share, in 1958. The company also realized an additional net gain of \$11.8 million from the sale of its majority stock interest in Hinde and Dauch Paper Co. of Canada, Ltd., to St. Lawrence Corporation.

Monsanto Buys Land For Experiment Farm

ST. LOUIS—Monsanto Chemical Co. is purchasing approximately 500 acres of farmland in Missouri's St. Charles County as the future location of an experimental farm for agricultural chemicals research.

The company said that it has exercised options to purchase tracts of land north and west of St. Charles, Mo.



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A WEEKLY NEWSPAPER FOR THE FARM CHEMICAL INDUSTRY

The regional circulation of this issue is concentrated in the Western states.

WIDESPREAD INFLUENCE . . .

Industry-Sponsored Research Essential to Continuing Educational Program for Users

THE PART PLAYED by industry in sponsoring research by agricultural experiment stations and in supporting extension activities in many parts of the country, is one that is often taken for granted and sometimes overlooked completely. The progress of agriculture as a whole owes much to this far-sighted contribution by industry.

While we tend to hear more about experiments and research in soil fertility and plant food use, this is certainly not the total extent of agricultural study. Insect control, weed control, plant disease prevention and various other good management practices are all under scrutiny and all contribute to the general efficiency of raising crops.

Some of these points were brought out in clear-cut style in a recent talk by Dr. E. T. York, Jr., director of the Alabama extension service, before the American Society of Agronomy. "When we consider research in effective fertilizer use, we normally think of such things as rate, source of nutrient, and placement studies, or research in soil testing or other diagnostic techniques," he said.

"Such research has contributed greatly to the more intelligent use of fertilizers by helping us make better predictions of crop response and by providing us with specific information about the relative effectiveness of various sources of plant food, the best methods of placement, etc. Work of this nature has been invaluable and is, in fact, indispensable," he added.

However, research in pest control, plant breeding and other management practices has contributed greatly, both directly and indirectly, to increasing fertilizer use. Direct contributions have been made by increasing yield potentials which may be reached only through high fertilizer usage. Further contributions have been made in the form of decreasing the risks and hazards involved in farming, making the grower more willing to invest larger amounts of capital in plant food.

Dr. York pointed out that fertilizer recommendations should be re-evaluated whenever new varieties or new management practices are introduced which influence yield levels. "This is a never-ending process," he observed. "Sometimes I wonder if we don't lag behind at times in adjusting our fertilizer recommendations to fit such changing conditions."

These changing conditions are a part of agricultural progress, and since research changes various practices, additional study is required to make adjustments to different situations. In this connection, results of soil fertility research often become outdated because changing conditions make it feasible and desirable to fertilize to higher levels than research had explored.

Obviously, research should not be limited to those conditions or treatments which at present are considered to be economically feasible. Experiments should be planned so that the full range of response will be covered, right up to the point where little or no response is obtained from the last increment of fertilizer added. One of the functions of research is to anticipate these changes and to have answers ready when needed.

Research in fertilizer use has in recent years pointed the way to a tremendous expansion in fertilizer consumption, and in this regard is still far out ahead. Actual use of fertilizer is considerably short of recommendations, however. Fertilizer consumption in many states is only one-third

to one-half what it would be if recommended rates were applied to all crops.

Not only has research shown that ample fertilization will permit more abundant crops, but will produce a return of from \$3 to \$10 for each dollar invested in plant food.

It is at this point that extension people and industry salesmen come into the picture to sell farmers on gaining full benefit from such research through greater application of profit-making plant food. It points to a great opportunity for the industry to assist further in a program to expand the market for its products . . . which puts both the industry and the extension service in similar positions of getting the farmer to fertilize at a rate which will afford him the greatest net return for his investments in labor, time and materials.

Dr. York observed that there may have been instances in the early days of the industry when fertilizer was sold "just to make a sale, with little consideration for what the farmer may actually need. Such practices have in the main become a thing of the past," he added. "Today, the leadership of the fertilizer industry recognizes that it is to their advantage to try to sell the farmer specifically what he needs; from what he can derive the greatest benefit. This is why industry programs today are tied in so closely with research and extension work of the land-grant colleges."

That the industry has gone a long way in supporting all types of worthwhile educational programs in the areas of fertilizer use, soil testing and agricultural economics, is a matter of long record.

Promotion of soil testing by various industry groups has resulted in wide acceptance of this technique of determining the soil's nutritional needs; publication of all types of booklets and special bulletins, as well as slides and movies have all contributed to the great progress noted in recent years.

Not only on a broad national scale is progress seen, but often on a local or state level. One fertilizer manufacturing firm, Michiana Chemical Co. of Niles, Mich., recently sponsored a meeting at its plant in which some 25 Michigan county agents and members of the department of soil conservation discussed such topics as better crop production and increased soil testing for the coming spring months. The conference was led by Dr. R. L. Cook, head of the soil science department of Michigan State University.

One extra advantage of this type of industry-extension working together, is that of keeping extension people informed on late techniques of manufacturing and impressing them that the fertilizer industry is continually seeking better methods of production.

Research is a boon to the entire agricultural chemical industry and the encouragement of more study and educational effort will be of great benefit to the industry in the long run.

The work of the National Plant Food Institute, the American Potash Institute, the National Agricultural Chemicals Assn. and various other state and regional groups representing the industry has been outstanding. There is always educational work to be done . . . research in showing users how to get the most out of their fertilizer and pesticide purchases.

The 1960 season, like all of its predecessors, will be a challenge.



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CROPLIFE is a controlled circulation journal published weekly. Weekly distribution of each issue is made to the fertilizer manufacturers, pesticide formulators and basic chemical manufacturers. In addition, the dealer-distributor-farm adviser segment of the agricultural chemical industry is covered on a regional (crop area) basis with a mailing schedule which covers consecutively, one each week, three geographic regions (South, Midwest and West) of the U.S. On the fourth week, production personnel in fertilizer manufacturing and pesticide formulating plants throughout the U.S. are covered in depth. To those not eligible for this controlled distribution, Croplife's subscription rate is \$5 for one year (\$8 a year outside the U.S.). Single copy price 35¢.

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MEETING MEMOS



Jan. 12—Annual Central Washington Fertilizer Conference, Mid-Columbia Junior College, Pasco, Wash.

Jan. 21-22—Fifth Annual Conference, Louisiana Agricultural Applicators Assn., Seaman A. Knapp Hall, Louisiana State University, Baton Rouge, La.

Jan. 20—Fertilizer Industry Conference, Pacific Northwest Plant Food Assn., Inland Power & Light Co. auditorium, Spokane, Wash.

July 27-30—Southwest Fertilizer Conference and Grade Hearing, Galvez Hotel, Galveston, Texas.

Meeting Memos listed above are being listed in this department this week for the first time.

Jan. 11-14—Kansas Fertilizer Dealer Meetings: Jan. 11, Hiawatha; Jan. 12, Lawrence; Jan. 13, Abilene, and Jan. 14, Belleville.

Jan. 13-15—Thirteenth Annual Meeting of the Ohio Pesticide Institute, Lincoln Lodge, Columbus, Ohio.

Jan. 12-13—Nebraska Fertilizer Institute annual convention, Pershing Auditorium, Lincoln, Neb.

Jan. 13—Georgia Plant Food Educational Society, University of Georgia, Athens, Ga.

Jan. 13—New Mexico Agricultural Chemical Conference, third annual meeting, Milton Hall, New Mexico State University, University Park, N.M., Dr. J. Gordon Watts, chairman.

Jan. 13-14—Pesticide School, North Carolina State College, Raleigh, N.C.

Jan. 13-15—Ninth Annual Convention, Agricultural Ammonia Institute, Statler Hilton Hotel, Dallas, Texas.

Jan. 13-15—Virginia Polytechnic Institute Agronomy Schools: Jan. 13, Culpeper; Jan. 14, Tappahannock; Jan. 15, Gloucester.

Jan. 14—Annual Western Oregon Fertilizer Conference, Withycombe Hall, Corvallis, Oregon.

Jan. 14-March 1—Ohio Regional Fertilizer and Lime Conferences: Jan. 14, Masonic Building, Ravenna; Jan. 18, Methodist Church, Caldwell; Jan. 19, 4-H Building, fairgrounds, Cadiz; Jan. 20, YWCA Building, Zanesville; Jan. 21, Methodist Church, Jackson; Jan. 26, Elks Building, Findlay; Jan. 27, Grange Building, New London; March 1, American Legion Building, Lebanon.

Jan. 14-15—Beltwide Cotton Production—Mechanization Conference, Peabody Hotel, Memphis, Tenn.

Jan. 14-15—Annual meeting of Georgia Plant Food Educational Soci-

ety in conjunction with Georgia Section, American Society of Agronomy and Soil Science Society of America, University of Georgia, Athens.

Jan. 14-16—10th Annual Convention of the Agricultural Aircraft Assn., El Mirador Hotel, Palm Springs, Cal.

Jan. 19-21—Twelfth Annual California Weed Conference, Sacramento, Cal.

Jan. 20-21—Third Annual Arizona Fertilizer Conference, University of Arizona campus, Tucson, Ariz.

Jan. 20-21—North West Agricultural Chemicals Industry Conference, Benson Hotel, Portland, Ore., C. O. Barnard, executive secretary.

Jan. 20-22—Thirteenth Annual Southern Weed Conference, Buena Vista Hotel, Biloxi, Miss.

Jan. 21—Northeast Region, National Plant Food Institute fertilizer sales promotion workshop, Hotel Hershey, Hershey, Pa.

Jan. 21—Fertilizer Sales Promotion Workshop, Hotel Hershey, Hershey, Pa.

Jan. 25—Wisconsin Lime and Fertilizer Day, University of Wisconsin campus, Madison, Wis.

Jan. 25-26—Second Annual Agricultural Pesticide Conference, Purdue University, Lafayette, Ind.

Jan. 25-27—Cotton States Branch, Entomological Society of America, DeSoto Hotel, Savannah, Ga.

Jan. 26-27—South Dakota Fertilizer Dealers Short Course, South Dakota State College, Brookings, S.D.

Jan. 27-28—Annual Illinois Custom Spray Operators' Training School, University of Illinois, Urbana, Ill.

Jan. 27-29—Symposium on Chemistry of Phosphate-Soil Reactions, Muscle Shoals, Ala.

Jan. 28-29—Annual meeting of the Colorado Agricultural Chemicals Assn., Cosmopolitan Hotel, Denver, Colo.

Feb. 1-5—Utah Fertilizer Dealers' Schools: Feb. 1, Richfield; Feb. 2, Provo; Feb. 3, Roosevelt; Feb. 4, Ogden; Feb. 5, Tremont.

Feb. 2-4—Pest Control Operators' School, North Carolina State College, Raleigh, N.C.

Feb. 3-4—Illinois annual fertilizer industry conference, University of Illinois, Urbana.

Feb. 4—New Pesticide Review for Northern California, Recreation Hall, University of California, Davis, Sponsored by the Western Agricultural Chemicals Assn. and the Entomology Club of Northern California.

Feb. 4—Executive Committee Meeting, National Safety Council, Fertilizer Safety Section, New Florida Hotel, Lakeland, Fla.

Feb. 8-9—Southwestern Branch, Entomological Society of America, Hilton Hotel, El Paso, Texas.

Feb. 8-9—Twenty-Second Annual Meeting, National Cotton Council of America, Statler-Hilton Hotel, Dallas, Texas.

Feb. 9-10—Utah Fertilizer Industry Conference: Feb. 9, Provo; Feb. 10, Ogden.

Feb. 9-11—Seventh Annual Agricul-

tural Chemicals Conference, Texas Technological College, Lubbock, Texas.

Feb. 9-11—Southern Regional Liquid Fertilizer Conference, Rock Eagle 4-H Club Center, Eatonton, Ga.

Feb. 10-12—Midwestern Chapter, National Shade Tree Conference, Annual Meeting, Sheraton-Fontenelle Hotel, Omaha, Noel B. Wyson, 536 N. Harlem Ave., River Forest, Ill., Secretary-Treasurer.

Feb. 11-12—Midwest Agronomists-Fertilizer Industry meeting, Edgewater Beach Hotel, Chicago, Ill.

Feb. 17-18, 23-25—Indiana Ammonia Service School; Feb. 17, Lafayette; Feb. 18, Bedford; Feb. 23, Valparaiso; Feb. 24, Ft. Wayne; Feb. 25, Muncie.

Feb. 17-18—Pest Control Conference, Alabama Polytechnic Institute campus, Auburn, Ala. Sponsored by A.P.I. and the Alabama Association for Control of Economic Pests.

Feb. 22-25—Weed Society of America meeting, in conjunction with Western Weed Conference, Cosmopolitan Hotel, Denver, Colo.

March 22-23—Western Agricultural Chemicals Assn., spring meeting, Miramar Hotel, Santa Barbara, Cal.

March 23-25—North Central Branch, Entomological Society of America, Schroeder Hotel, Milwaukee, Wis.

March 30-31—Twenty-fourth annual meeting, Georgia Entomological Society, New Science Center, University of Georgia, Athens, Ga.

June 12-15—National Plant Food Institute annual meeting, Greenbrier Hotel, White Sulphur Springs, W. Va.

June 27-29—Pacific Branch, Entomological Society of America, Davenport Hotel, Spokane, Wash.

July 13-15—Eleventh Annual Fertilizer Conference of the Pacific Northwest, Hotel Utah, Salt Lake City; B. E. Bertramson, State College of Washington, Pullman, Wash., chairman.

July 27-29—Great Plains Agricultural Council, 1960 meeting, Laramie, Wyo.

STORE OPENS

SILVER CITY, N.M.—Dick Manning Feed & Seed has been opened at 2011 Juniper, with R. C. Manning as owner.

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Classified advertisements accepted until Tuesday each week for the issue of the following Monday.

Rates: 15¢ per word; minimum charge \$2.25. Situations wanted, 10¢ a word; \$1.50 minimum. Count six words of signature, whether by direct reply or keyed care this office. If advertisement is keyed, care of this office, 20¢ per insertion additional charged for forwarding replies. Commercial advertising not accepted in classified advertising department. Display advertising accepted for insertion at minimum rate of \$11 per column inch.

All Want Ads cash with order.

HELP WANTED

EXPERIENCED, MATURE SALESMAN for national manufacturer, agricultural chemicals. Sales at distributor dealer levels, southern California and southern Arizona. Complete resume, age, education, experience and availability first letter. Address Ad No. 5494, Croplife, Minneapolis 40, Minn.

DISTRIBUTORS AND DEALERS OF THE fastest growing cattle, sheep and dairy feed in the United States are seeking salesmen and managerial personnel. Here is an opportunity to grow with a young, dynamic industry. Proven, efficient savings to farmers, cattle, for instant in many states achieved cheaper and faster and easier with these scientific advanced methods on feeding protein supplement free choice. If you are interested to work with independent and successful distributors and dealers, with a product unequalled and of great benefit to the farmers, write to Liquid Feed Association, Ad No. 5499, Croplife, Minneapolis 40, Minn.

OPPORTUNITY OF LIFETIME FOR HARD working, ambitious man under 40 years with well rounded fertilizer experience, especially sales, to join aggressive independent fertilizer company with multiple plants in Northeast. To come in on management basis, stock option plan to arrive at proprietorship basis out of bonus, good salary. Farm background, degree in agronomy preferable. Must be high quality in every respect. Give full information, we will not contact your present connection. This is opportunity to move forward into proprietorship out of incentive earnings. Address Ad No. 5532, Croplife, Minneapolis 40, Minn.

1959 Pesticide Sales Increase in Canada

OTTAWA—Sales of pest control products by Canadian registrants in the 12 months ended September, 1959, were valued at \$24,838,000, compared with \$20,612,000 a year earlier.

Sales by main groups follow: agricultural dusts and sprays, \$9,630,000 (\$7,976,000 in 1958); livestock treatments, \$1,748,000 (\$1,703,000); herbicides, \$7,608,000 (\$5,666,000); household and industrial insecticides, \$5,405,000 (\$4,207,000); and rodenticides, \$447,000 (\$349,000). Sales of products for which details are not available totaled \$485,000 compared with \$700,000 the previous year.

BRUSH AND WEED KILLERS
KILL BRUSH of low cost with amazing R-H BRUSH KILLER. Will kill brush, grasses, weeds, not poisonous. For free information write Reaser-Hill Corporation, Box 36CL, Jacksonville, Ark.

KILL SUBMERGED WATER WEEDS which feed up water propellers, tangle fishing gear, with R-H WEED KILLER-20, Granular 2-4-D. Inexpensive, easy to use, sure results. For free information write Reaser-Hill Corporation, Box 36CL, Jacksonville, Ark.

MR. CORN FARMER: Control broad leaved weeds and grasses (crab grass, fat hells) with R-H WEED KILLER-20, Granular 2-4-D. For free information write Reaser-Hill Corporation, Box 36CL, Jacksonville, Ark.

A Complete Sales Medium...

CROPLIFE is the only *complete sales medium* directed to the agricultural chemical industry. It is a newspaper appealing to all segments of the industry. One of its editorial functions is to knit more closely together all those industry elements—manufacturers, agents, retailers, the educational echelon and farm advisor groups. It does this by:

- Keeping all segments informed of all industry news.
- Providing feature material designed to help manufacturers and mixers to do a better job, to help dealers sell and to help farm advisors and educational people make sound recommendations.
- Keeping all industry alert to current and proposed government action.
- Providing a channel through which news and advertising can reach all segments of the industry.

This new approach to business journalism for the agricultural chemical industry is being made by a company with 87 years of experience in news-gathering and publishing and one which has built an unchallenged reputation for reliability and service. Advertising of your products and services in Croplife will mean *richer sales fields* for you!

National Coverage . . .

Croplife's carefully controlled circulation provides national coverage of manufacturers, formulators, mixers and ingredient suppliers.

Plus Regional Concentration . . .

In addition a unique regional circulation plan provides advertisers with a selective marketing-area coverage of wholesale and retail dealers and farm advisory personnel.

WRITE—WIRE—PHONE our nearest office for complete analysis of Croplife's important role in your advertising program.



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